CCD-F455E
RMT-502

SERVICE MANUAL

AEP Model
UK Model
E Model

Remote commander is available as a unit, but as individual parts the battery case lid of commander is only available.

This photo is AEP/UK model.

Handycam
Video 8

For MECHANICAL ADJUSTMENTS, refer to the "8mm Video MECHANICAL ADJUSTMENT MANUAL III (U MECHANISM)" (9-972-732-11)

SPECIFICATIONS

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	PAL colour, CCIR standards
Usable cassette	8 mm video format cassette
Tape speed	SP mode: Approx. 20.051 mm/sec. LP mode: Approx. 10.058 mm/sec.
Recording/Playback time	SP mode: 1 hour 30 min. (P5-90) LP mode: 3 hours (P5-90)
Fast-forward/rewind time	Approx. 6 min. 30 sec. (P5-90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 8 × power zoom lens f=8.5 to 68 mm. F 1.6 with macro Filter diameter: 46 mm
Auto focus system	TTL
Colour temperature	AUTO, HOLD ☼ INDOOR 3,200 K • OUTDOOR 5,800 K
Minimum illumination	3 lux (F 2.0)
Illumination range	3 lux to 100,000 lux (0.3 to 9,294 footcandles)
Recommended illumination	More than 100 lux (9 footcandles)
Aperture correction	Automatic With backlight adjustment

Input and output connector

Video input*/output	Phono jack, 1 Vp-p, 75 ohms unbalanced, sync negative
Audio input*/output	Phono jack Input: −7.5 dBs, input impedance more than 47 kilohms Output: −7.5 dBs, (at output impedance less than 1 kilohms)

* input: E model only.

RFU DC OUT	Special minijack (1), 5 V DC
Earphone jack	Minijack (1), 8-ohm impedance
Remote jack	Stereo mini-minijack (1)
MIC jack	Minijack (1), –66 dBs, low impedance with 2.5 to 3 V DC output, impedance 6.8 kilohms
Microphone power output jack	special minijack (1), 5 V DC

— continued on next page —

MICROFILM

8 VIDEO CAMERA RECORDER

SONY®

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor) 9.0 V (alkaline batteries)
Power consumption	6.5 W (camera recording) including the viewfinder
Installation	Vertically, horizontally
Operating temperature	0°C to 40°C
Storage temperature	−20°C to +60°C
Dimensions	Approx. 111 × 139 × 330 mm (w/h/d)
Weight	Approx. 1.2 kg excluding the battery and cassette
Microphone	Electret condenser microphone, uni-directional monaural type

Wireless Remote Commander

Remote control system	Infrared control
Command mode	VTR2
Power requirements	3 V DC, 2 R6 (size AA) batteries
Dimensions	Approx. 57 × 20 × 120 mm (w/h/d)
Weight	Approx. 62 g

Design and specifications are subject to change without notice.

Note

This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

Supplied Accessories

The camcorder is packed together with the following units. Check to see that everything is contained in the package. (* Attached to the camcorder)

- Remote Commander (1)
- R6 (size AA) battery for Remote Commander (2)
- Battery pack NP-66 (1)
- AC power adaptor AC-V60A (1)
- Lithium battery CR2025 (1)
- RFU adaptor RFU-90E or RFU-89EA (1)
  With the RFU-89EA, an aerial selector and a screwdriver are supplied.
- Cassette tape (1)
- Shoulder strap (1)
- Lens cap (1)*

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

TABLE OF CONTENTS

Section *Title* *Page*

1. GENERAL

- Identifying the Parts 6
- Connecting the Power Sources 9
- Using the Best of the Battery Pack 11
- Setting the Data and Time 13
- Inserting a Tape 14
- Adjusting the Viewfinder Lens 14
- Recording a Picture Using Automatic Adjustment 15
- Selecting the Automatic/Manual Adjustment 18
- Manual Focusing 19
- Adjusting the White Balance 20
- Setting Shoutter Speed 21
- Shooting with Backlighting 21
- Using the PROGRAM AE Button 22
- Zooming 23
- Close-up (Autofocusing in Macro) 23
- Fade-in and Fade-out 24
- Superimposing a Title 25
- Recording the Age of Your Child 28
- Connections for Playback 30
- Playing Back a Tape 31
- Using the Tape Counter 33
- Editing onto Another VTR 33
- Hints for Better Shooting 34
- Notes and Precautions 35
- Using your Camcorder Abroad 36
- Indications Inside the Viewfinder and the Display Window 36

2. DISASSEMBLY

2-1. Removal of Cassette Lid Assy 37
2-2. Removal of VTR Panel (L) Assy 37
2-3. Removal of Lens Hoop 37
2-4. Removal of Cabinet (L) Assy 37
2-5. Removal of Cabinet (R) Assy 38
2-6. Removal of Microphone(MC-76 Board) 38
2-7. Removal of EVF Assy 38
2-8. Removal of Camera Block 39
2-9. Removal of CCD Imager(CD-65 Board) 39
2-10. Removal of VA-67 Board 40
2-11. Removal of SS-136 Board 40
2-12. Removal of Cassette Compartment Assembly 40
2-13. Internal Views 41

Section *Title* *Page*

3. DIAGRAMS

3-1. Circuit Boards Location 43
3-2. Overall Block Diagram 44
3-3. Camera (1) Block Diagram 47
3-4. Camera System Control VC-99 Board IC501 (MC68HC11E9) 51
3-5. Camera (2) Block Diagram 53
3-6. Digital Titler Block Diagram 58
3-7. Video (1) Block Diagram 61
3-8. Video (2) Block Diagram 67
3-9. Servo Block Diagram 69
3-10. System Control Block Diagram 73
3-11. Servo, System Control System Terminal Function SS-136 Board IC501 (CXP80116) 77
3-12. Mode Control System IC Terminal Function Description FU-100 Board IC501 (μPD75316) 80
3-13. Audio Block Diagram 82
3-14. Viewfinder Block Diagram 85
3-15. Power Block Diagram 86

4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. Frame Schematic Diagram 89
4-2. Printed Wiring Boards and Schematic Diagrams 92
  - Precaution for replacement of CCD imager block 93
  - CD-65 and VC-99 Boards 94
  - AF-86 Board 104
  - CT-38 Board 109
  - VA-67 Board 114
  - CC-61, SS-136, FP-89 and FP-90 Boards 124
  - CK-50, DK-15, ED-32, LI-39, RM-50, VK-14 and ZK-14 Boards 134
  - FU-100 Board 139
  - MC-76 and SW-183 Boards 143
  - VF-26 and VF-27 Boards 147

4-3. Semiconductors 149

5. EXPLODED VIEWS

5-1. Cabinet (R) and VTR Panel (L) Assemblies 151
5-2. Cabinet (L) Assembly 152
5-3. EVF Assembly 153
5-4. Mechanical Deck Assembly (1) 154
5-5. Mechanical Deck Assembly (2) 155
5-6. Mechanical Deck Assembly (3) 156
5-7. Main Boards Assemblies 157
5-8. Camera Block Assembly 158
5-9. Zoom Lens Assembly (1) 159
5-10. Zoom Lens Assembly (2) 160

Section *Title* *Page*

6. ELECTRICAL PARTS LIST 161
HARDWARE LIST 189

7. SERVICE MODE
7-1. SENSER LANC 190
7-1-1. How to Use RM-95 jig 190
7-1-2. Transfer Method of the Service Mode with RM-95 191
7-1-3. SENSER LANC Memory Map 192
7-1-4. Types of Self-diagnostic Feature 193
7-1-5. How to Use Practically 194

8. MECHANICAL ADJUSTMENTS
8-1. Setting the Track Shift Mode 195
8-2. Preparation for Adjustment 195

9. CAMERA ADJUSTMENTS
9-1. List of Servicing Jigs 196
9-2. Preparation for Adjustment 198
9-2-1. Preparation 198
9-2-2. Caution 199
9-2-3. Adjustment Remote Control 200
9-2-4. Checkpoint Array 210
9-2-5. AF Microcomputer Data Reader Jig 211
9-2-6. Data Processing 211
9-3. Adjustment of Camera System 212
9-3-1. Prime Oscillation Adjustment 212
9-3-2. PLL Adjustment 212
9-3-3. Flange Back Adjustment 212
9-3-4. Camera DC-DC Converter Voltage Check 213
9-3-5. EVR Initial Setting of Adjustment Page F 213
9-3-6. PG CONT/V SUB Adjustment 215
9-3-7. HALL Adjustment 216
9-3-8. IRIS Adjustment 216
9-3-9. Shutter IN/OUT Adjustment 217
9-3-10. AGC Adjustment 217
9-3-11. Matrix Adjustment 218
9-3-12. Y_H Level Adjustment 219
9-3-13. Chroma Level Adjustment 220
9-3-14. Sync Level Adjustment 220
9-3-15. Setup Adjustment 221
9-3-16. White Clip Adjustment 221
9-3-17. Y Level Adjustment 222
9-3-18. H Aperture Adjustment 222
9-3-19. Max Gain Adjustment 223
9-3-20. Burst Level Adjustment 223
9-3-21. Standard AE Level Adjustmeunt 224
9-3-22(A). Pre-white Balance Adjustment (with Vectorscope) 224
9-3-22(B). Pre-white Balance Adjustment (with Oscilloscope) 225
9-3-23. Color Reproducibility Adjustment 225
9-3-24. Auto White Balance Adjustment 226
9-3-25. Outdoor White Balance Check 231
9-3-26. Focus Motor Speed Adjustment 231
9-3-27. AF Adjustment 232
9-4. Digital Titler System Adjustment 233
9-4-1. Chroma Phase/Gain Adjustment 233

10. ELECTRICAL ADJUSTMENTS
10-1. Preparation for Adjustment 234
10-1-1. Equipment Required 234
10-1-2. Precaution for Adjustment 234
10-1-3. Equipment Connection 234
10-1-4. Setting up for Adjustment 234
10-1-5. Alignment tape 235
10-1-6. Input/Output Level and Impedance 235
10-1-7. Service Mode 236
10-1-8. To Set the AEP, UK Model to REC Model 241
10-2. Power Voltage Check 241
10-3. System Control System Adjustment 242
10-3-1. Battery Down Adjustment 242
10-3-2. Clock Accuracy Adjustment 242
10-4. Servo System Adjustment 243
10-4-1. Switching Position Adjustment 243
10-4-2. Oscillation Frequency Adjustment 243
10-4-3. Output Voltage Adjustment 243
10-5. Video Adjustment 244
10-5-1. Playback Frequency Characteristic Adjustment 244
10-5-2. X'tal Oscillator fo Check 245
10-5-3. REC E-E Level Adjustment 245
10-5-4. IR Adjustment 245
10-5-5. Chroma Comb Filter Adjustment 246
10-5-6. Emphasis Y Level Adjustment 246
10-5-7. Y FM Carrier Frequency Adjustment 246
10-5-8. Y FM Deviation Adjustment 247
10-5-9. REC Y FM Level Adjustment 247
10-5-10. Chroma Emphasis Adjustment 247
10-5-11. HUE Phase Deviation Adjustment 248
10-5-12. REC Chroma Level Adjustment 248
10-5-13. PB CCD Input Level Adjustment 248
10-5-14. PB Level Adjustment 249
10-5-15. 4FSC Frequency Adjustment 249
10-5-16. Controller Frequency Adjustment 249
10-5-17. Tracking TH Adjustment 250
10-5-18. Character Generator SG Frequency Adjustment 250
10-5-19. DDS Character Position Adjustment 250
10-6. Audio System Adjustment 251
10-6-1. AFM Carrier Frequency Check 251
10-6-2. REC AFM Carrier Level Check 251

Section *Title* *Page*

10-6-3. IR Adjustment 251
10-6-4. Deviation Adjustment 252
10-6-5. E-E Output Level Check 252
10-6-6. Overall Level Check 252
10-6-7. Overall Frequency Characteristics Check 252
10-6-8. Overall Distortion Check 252
10-6-9. Overall Noise Level Check 253
10-7. Electronic Viewfinder System Adjustment (A TYPE) 253
10-7-1. Horizontal Tilt Adjustment 253
10-7-2. Centering Adjustment 254
10-7-3. Focus Adjustment 254
10-7-4. Aberration Adjustment 254
10-7-5. Horizontal Oscillation Frequency Adjustment 254
10-7-6. Horizontal Amplitude Adjustment 255
10-7-7. Vertical Amplitude Adjustment 255
10-7-8. Brightness, Contrast Adjustments 255
10-7-9. Horizontal Amplitude, Vertical Amplitude and Focus Checks 255
10-8. Electronic Viewfinder System Adjustment (B TYPE) 256
10-8-1. Horizontal Tilt Adjustment 256
10-8-2. Centering Adjustment 256
10-8-3. AFC Adjustment 257
10-8-4. Horizontal Amplitude Adjustment 257
10-8-5. Vertical Amplitude Adjustment 258
10-8-6. Focus Adjustment 258
10-8-7. Brightness, Contrast Adjustments 258
10-9. Adjusting Part Location Diagram 260

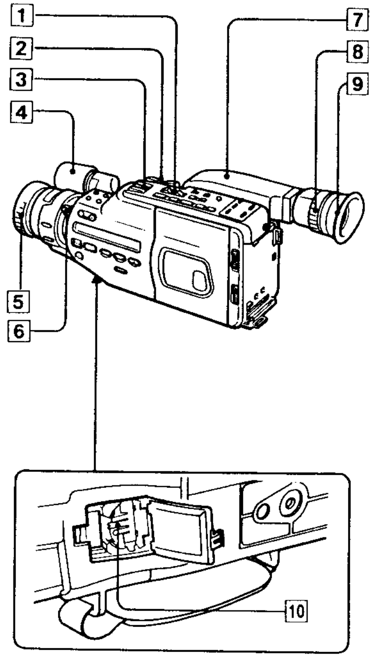
The color reproduction standard frame is contained after the camera adjustments.

SECTION 1
GENERAL

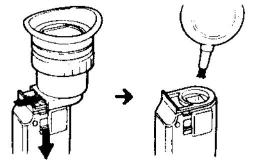
This section is extracted from instruction (AEP/UK model) manual.

Identifying the Parts

(A-1)



(A-2)



For details on the use of each control, refer to the pages indicated in the circle.

(A-1)

1 **POWER switch**
CAMERA: for camera recording
PLAYER: for playing back or editing tapes
OFF: power off

2 **Power zoom button ㊳**

3 **Accessory shoe**
Attach a video light, external microphone, etc. (not supplied).

4 **Built-in microphone (monaural)**

5 **Lens hood (Focus ring) ㉛**

6 **Zoom lever ㊳**

7 **Viewfinder**
The picture being recorded or played back can be monitored in black and white here. Also, marks such as caution indicators and function mode appear here.

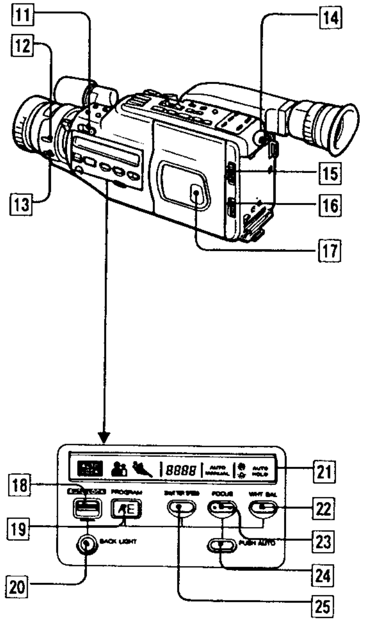
8 **Viewfinder lens adjustment ring ㉑**

9 **Eyecup**

10 **Lithium battery compartment (bottom) ⑱**

To remove dust from inside the viewfinder (A-2)
Detach the eyecup as illustrated and clean the surface of the screen with a blower.

(A-3)



(A-3)

11 **EDITSEARCH (and recording review) button ㉖**

12 **FADER button ㊶**

13 **MACRO AF (Autofocusing in macro) button ㊴**
Press to record close-ups with automatic focusing.

14 **Camera recording/battery lamp**
Lights up during recording and blinks when the battery becomes weak.

15 **EJECT (cassette eject) button ⑳**

16 **BATT (battery eject) knob ⑫**

17 **Cassette holder**

18 **AUTO LOCK switch ㉙**
When you record with automatic adjustment, set this switch to the green position.

19 **PROGRAM AE (programme auto exposure) button ㊱**

20 **BACK LIGHT button ㉟**

21 **Display window**

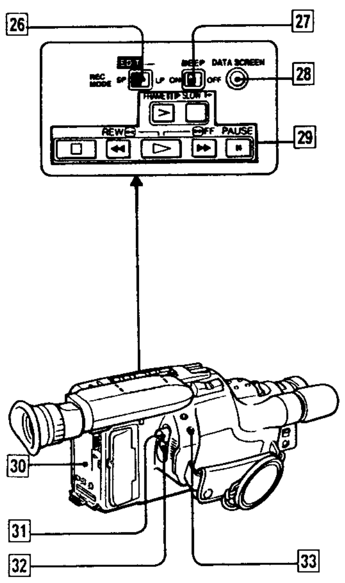
22 **WHT BAL (white balance) button ㉜**

23 **FOCUS button ㉛**

24 **PUSH AUTO button ㉛**

25 **SHUTTER SPEED button ㉞**

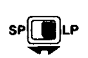
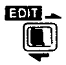
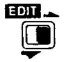
(A-4)



(A-4)

26 **REC MODE (recording mode)/EDIT switch** ㉒ (59)

Switch it depending on the operating mode.

Mode	Recording	Playback	Editing
Setting	 SP LP	 EDIT	 EDIT
Function	Recording mode switch	EDIT switch	

27 **BEEP switch** ㉓
Normally set to "ON" to activate the recording start/stop beeps and the warning beeps.
To deactivate the beeps, set the switch to "OFF".

28 **DATA SCREEN button** (55)

29 **Tape transport buttons** (55) (56)
>/II ▶ FRAME (forward direction/frame-by-frame in forward direction)
I▶ SLOW
□ (stop)
◀◀ REW (rewind)
▷ (playback)
▶▶ FF (fast-forward)
II PAUSE

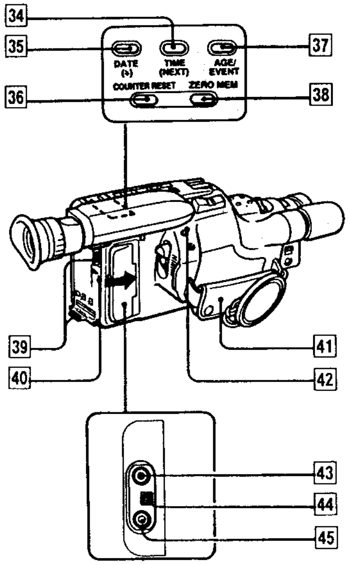
30 **Battery mounting surface** ⑫

31 **STANDBY switch** ㉒
Slide up to set the camcorder to standby mode.

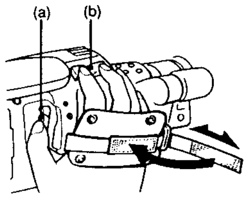
32 **START/STOP button** ㉒
Press to start and stop camera recording.

33 **🎧 (earphone) jack (minijack)** ㉘

(A-5)



(A-6)



(A-5)

34 **TIME (NEXT) button** ⑲ ㉕ ㊽

35 **DATE (+) button** ⑲ ㉕ ㊽

36 **COUNTER RESET button** ㉗ (58)

37 **AGE/EVENT button** ㊿

38 **ZERO MEM (zero memory) button** ㉗ (58)

39 **Hooks for shoulder strap**

40 **REMOTE COMMANDER ON/OFF switch** ⑨
Set to "ON" when using the supplied wireless Remote Commander. When you do not use the Commander, set to "OFF" to keep the unit from being operated incorrectly by another Commander, etc.

41 **Grip belt (A-6)**
Adjust the length so that your thumb and fingers can easily manipulate the START/STOP button (a) and the power zoom button (b).

42 **REMOTE (LANC)*control connector (stereo mini-minijack)**
Connect a wired remote control unit or an editing controller, etc. here.

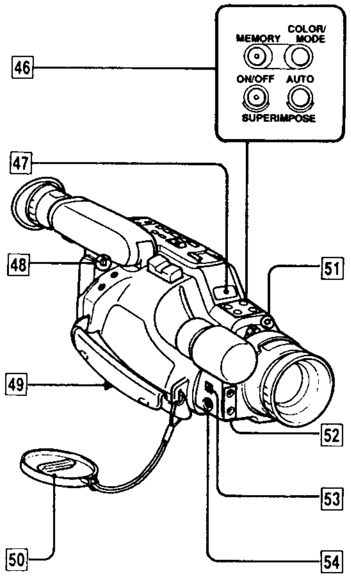
43 **AUDIO OUT (output) jack (phono jack)**

44 **RFU DC OUT (RFU adaptor DC output) jack (special minijack)**
Attach the supplied RFU adaptor here.

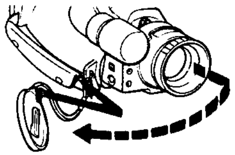
45 **VIDEO OUT (output) jack (phono jack)**

***About the (LANC)**
LANC stands for Local Application Control Bus System. The LANC connector is used for controlling the tape transport of video equipment and peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

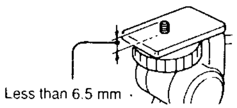
(A-7)


46
47
48
49
50
51
52
53
54
MEMORY
COLOR/ MODE
ON/OFF
AUTO
SUPERIMPOSE

(A-8)



(A-9)


Less than 6.5 mm
(9/32 inches)

(A-7)

46 **SUPERIMPOSE buttons ㊷**
MEMORY button
COLOR/MODE button
AUTO button
ON/OFF button

47 **Remote sensor ⑩**

48 **PUSH SLIDE (viewfinder positioning) button**
Slide the viewfinder to a suitable position.

49 **Tripod receptacle (bottom)**

50 **Lens cap (A-8)**

51 **Camera recording/battery lamp**

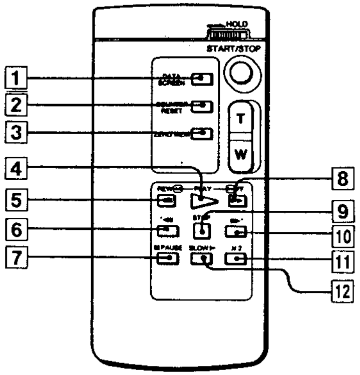
52 **MIC (microphone) jack (minijack) and DC OUT (power output) jack (mini-minijack)**
Connect an external microphone (not supplied).
The MIC jack accepts a "plug-in-power" microphone and the DC OUT jack supplies power to it.

53 **BUILT-IN MIC (microphone) switch ㉕**
Set to "WIND" when recording in a strong wind.

54 REC START/STOP button (for low-position recording) ㉓
Use this button instead of the START/STOP button for easier low-position recording.

Note (A-9)
When attaching a tripod other than Sony's, make sure that the length of the camera mounting screw is less than 6.5mm. Otherwise, the screw may damage the inner parts of the camera.

(A-10)


1
2
3
4
5
6
7
8
9
10
11
12
HOLD
START/STOP
DATA SCREEN
COUNTER RESET
ZERO MEM
T
W
REW
PLAY
FF
STOP
PAUSE
SLOW
x 2

Wireless Remote Commander

You can play back a tape from a distance. The buttons on the Remote Commander with the same name or mark as those on the camcorder have the same function.

When you use the Commander
Be sure to set the ■ REMOTE COMMANDER ON/OFF switch on the camcorder to "ON", and then start operation of the camcorder, with the Commander pointing towards the remote sensor. (See "Remotely controllable area" on page 10.)

(A-10)

1 **DATA SCREEN button (55)**

2 **COUNTER RESET button ㉗ (58)**

3 **ZERO MEM (memory) button ㉗ (58)**

4 **▷ PLAY (playback) button (55)**

5 **◀◀ REW (rewind) button (55), (57)**

6 **</◀II (reverse direction/reverse frame) button* (56)**

7 **II PAUSE button (56)**

8 **FF ▶▶ (fast-forward) button (55), (57)**

9 **□ STOP button (55)**

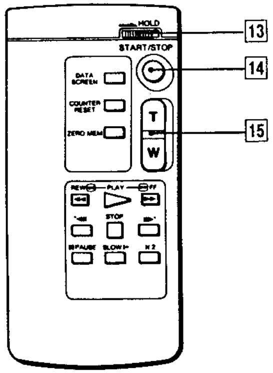
10 **>/II▶ (forward direction/forward frame) button (56)**

11 **×2 (double speed playback) button* (56)**

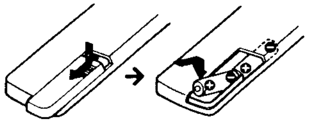
12 **I▶ SLOW button (56)**

Note
The * indicates the functions which are operable only with the Commander.

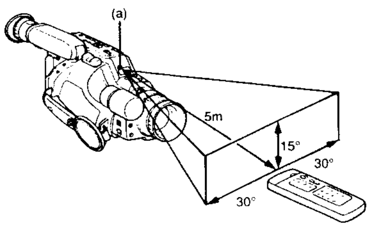
(A-11)



(A-12)



(A-13)



(A-11)

13 **HOLD switch**
Slide in the direction of the arrow to prevent the buttons from being accidentally pressed.

14 **START/STOP button**
Press to start and stop camera recording.

15 **Power zoom button ㊳**

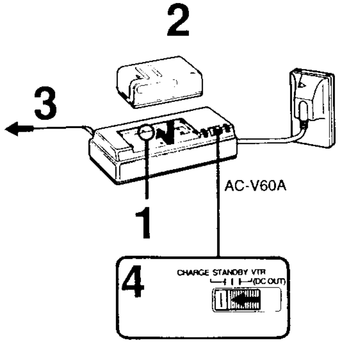
Inserting batteries (A-12)
Insert two R6 (size AA) batteries with polarity positioned correctly.

Remotely controllable area (A-13)
Point the Commander towards the remote sensor (a).

Note on batteries
With normal operation, batteries will last for about six months. However, if the Commander will not be used for a long period, remove the batteries to avoid possible damage from battery leakage.

Notes on the Remote Commander
- Keep the remote sensor away from the strong light source such as direct sunlight or illumination. Remote control with the Commander may not be effective.
- Be sure that there is no obstacle between the remote sensor and Commander.
- The command mode of the Commander is VTR2. Avoid to use the Sony VTRs with the same command mode at the same time.
- Be sure to set R REMOTE COMMANDER ON/OFF on the camcorder to OFF when you connect the receiver of a remote control kit (not supplied) to the REMOTE control connector.

(B-1)



Preparing your camcorder 1

Connecting the Power Sources

First, Choose the Power Source.

Place	Power source	Accessory to be used
Outdoors	Battery pack	Battery pack NP-66 (supplied), NP-66H, NP-77H, NP-77 or NP-55
	Alkaline batteries	Battery case EBP-77 or EBP-55
Indoors	House current	AC power adaptor AC-V60A (supplied), AC-V30 or AC-V55
In the car	12V or 24V car battery	DC pack DCP-77, or AC power adaptor AC-V55 and car battery cord DCC-16AE

Note on power sources
Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape. In this case supply the power again immediately.

Using the Battery Pack

Step 1

Charge the battery pack. (B-1)

1 **Align the groove on the battery pack with that on the AC power adaptor.**

2 **Slide in the battery pack to the right.**

3 **Connect the AC power adaptor to a wall outlet.**

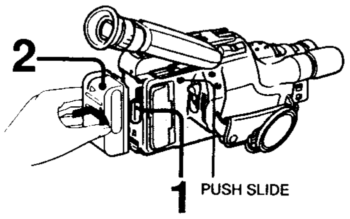
4 **Set the CHARGE/VTR selector of the AC power adaptor to CHARGE.**
Charging begins.

	NP-66 (supplied)	NP-66H	NP-77H	NP-77	NP-55
Required charging time	80	100	140	120	60

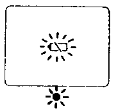
(approx. minutes using AC-V60A)

See the instruction manual of the AC power adaptor for details.

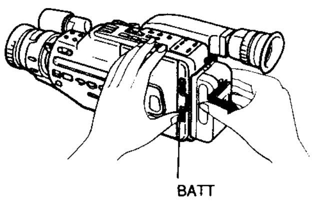
(B-2)



(B-3)



(B-4)



Step 2

Mount the battery pack on the camcorder.
(B-2)

1 **Align the right side of the battery pack with the line on the camcorder.**

2 **Slide in the battery pack to the right.**
Notes:
- Make sure the battery fits completely on the mounting surface of the camcorder. Imperfect fit may damage the projections on the camcorder.
- If your nose touches the battery pack, adjust the position of the viewfinder by sliding it while pressing PUSH SLIDE.

Battery life
A fully charged battery pack lasts for:

	NP-66 (supplied)	NP-66H	NP-77H	NP-77	NP-55
Battery life	70	85	110	90	50

(approx. minutes, continuous recording indoors)

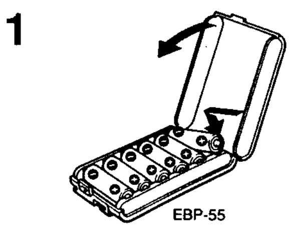
When the battery becomes weak, the ⌧ indication and red lamp blink in the viewfinder. **(B-3)** Also the camera recording/battery lamps on the camcorder blink. Replace the battery pack with a fully charged one.

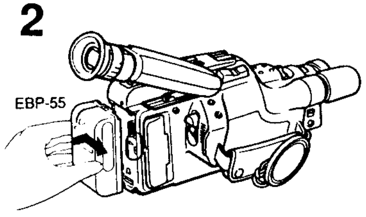
To remove the battery pack (B-4)
Slide BATT up, and slide out the battery pack to the left.

Other options for charging
- AC-V55 AC power adaptor:
  You can charge two battery packs simultaneously.
- DC-V30 car battery charger:
  You can charge a battery pack by connecting the car battery charger to the cigarette lighter socket. This battery charger also supplies power to Sony 8 mm equipment that operates on a battery pack.

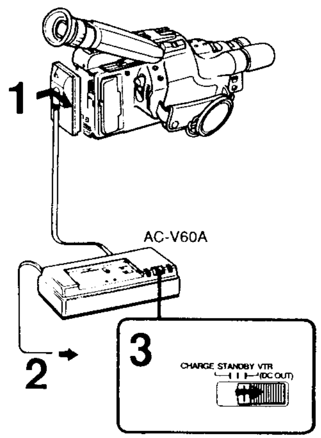
If you have an NP-4000
You can use it for long outdoor recording.

(B-5)





(B-6)



Using Alkaline Batteries

(B-5)
The EBP-55 or EBP-77 battery case (not supplied) is required .

1 **Insert the R6 alkaline batteries into the battery case.**
(12 batteries for EBP-77 and 6 batteries for EBP-55)

2 **Attach the case in the same way as the battery pack.**

Battery life (when using Sony alkaline batteries)

	EBP-77	EBP-55
Battery life	120	45

(approx. minutes, continuous recording indoors)

To remove the battery case
Remove it in the same way as you do with the battery pack.
See page 12.

Notes on battery life
- Batteries will not last as long in cold places.
- No indication appears in the viewfinder to warn of a weak battery.

Using House Current

(B-6)
Use the supplied AC-V60A AC power adaptor.

1 **Align the right side of the connecting plate with the line on the camcorder, and slide it in to the right.**

2 **Connect the AC power adaptor to a wall outlet.**

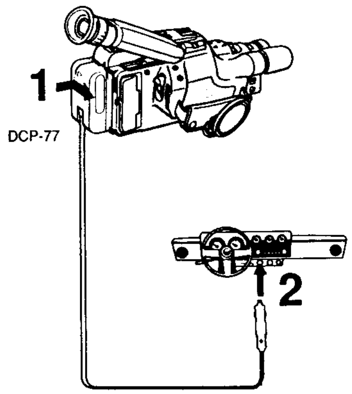
3 **Set the CHARGE/VTR selector of the AC power adaptor to VTR.**

See the instruction manual of the AC power adaptor for details.

To remove the connecting plate
Remove it in the same way as you do with the battery pack.
See page 12.

Other options
The AC-V30 or AC-V55 AC power adaptor can also be used.

(B-7)



Using Car Battery

(B-7)
The DCP-77 DC pack is required (not supplied).

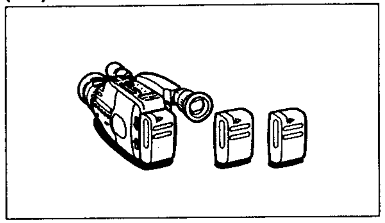
1. **Align the right side of the DC pack with the line on the camcorder, and slide it in to the right.**

2. **Connect the cord of the DC pack to the cigarette lighter socket of a car (12 V or 24 V).**

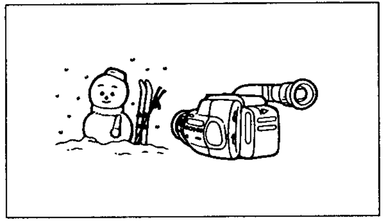
To remove the DC pack
While pressing the BATT knob on the camcorder, slide the DC pack to the left and pull out.

Other options
- The AC-V55 AC power adaptor and the DCC-16AE car battery cord can also be used to operate this camcorder on a 12 V or 24 V car battery.
- The DCP-55 DC pack can also be used to operate this camcorder on a 12V or 24V car battery.

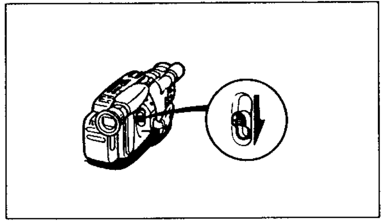
(C-1)



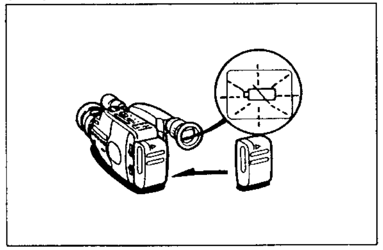
(C-2)



(C-3)



(C-4)



Using the Best of the Battery Pack

How to Prepare the Rechargeable Battery Pack

Have sufficient battery pack power to do 2 or 3 times as much recording than you have planned. (C-1)
"Battery life" as indicated in the instruction manual or catalogue of the camcorder is measured by the continuous recording time of the camcorder, placed at a room temperature using a full-charged battery.

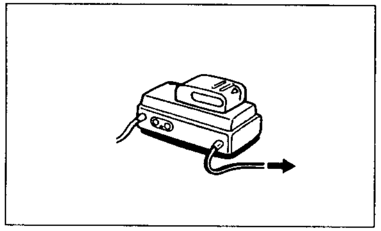
Battery life is shorter in a cold climate. (C-2)
Battery efficiency is decreased and the battery will be used up more quickly.

Turn the STANDBY switch of the camcorder off when not recording to save battery power. A smooth recording can be made even if recording is stopped and started again. (C-3)
While positioning the subject or selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery is also used when a tape is inserted or removed.

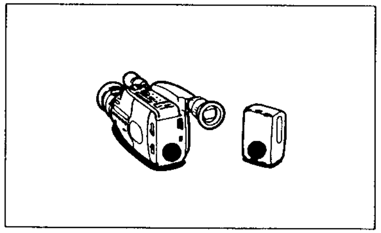
When the Rechargeable Battery Pack Should Be Replaced

When the ▭ mark and red lamp in the viewfinder change from slow blinking to rapid blinking while you are recording, (C-4)
Turn off the power switch of the camcorder and replace the battery pack. Leave the tape in the camcorder in order to obtain a smooth recording after the battery pack is replaced.

(C-5)



(C-6)



Notes on Charging

Before using the battery pack, charge it sufficiently. A brand new battery pack is not charged.

Recharge the battery pack only when it is exhausted. (C-5)

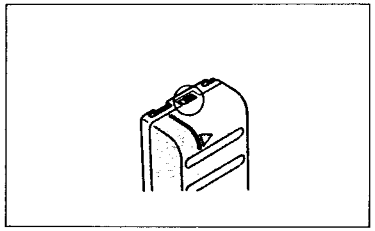
- If recording is completed before the ▭ mark appears in the viewfinder, it is recommended that you remove the tape, set POWER to CAMERA, slide up STANDBY, and leave the camcorder until the ▭ mark blinks rapidly.
- Repeated charging while some capacity remains causes a lowering of battery capacity. However, **the original battery capacity can be recovered if you fully discharge and charge the battery again.**

Recharge the battery pack before using.
If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged.
Charge it again but in this case the battery life will be shortened than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

Keep the Terminals Clean

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened. (C-6)
When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact condition.
Also, wipe the + and – terminals with a soft cloth or paper.

(C-7)



Notes on the Rechargeable Battery Pack

Why the battery pack heats up?
During charging or recording, the battery pack heats up. This means energy has been generated and chemical change has occurred inside the battery pack and this is not dangerous.

How to care for the battery pack

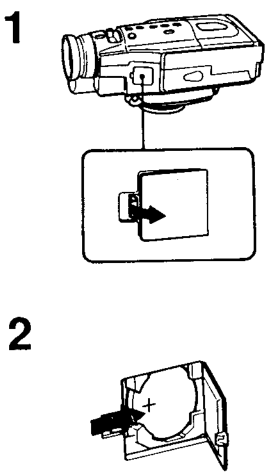
- Remove the battery pack from the camcorder after using it, and keep it in a cool place. When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is turned off. It causes overdischarging and shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Thus, it is recommended you charge the battery before using.

How to use the switch on the battery pack (C-7)
This switch is provided so that you can remember the charging condition. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up.

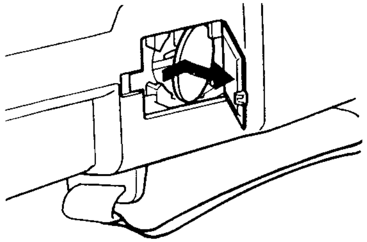
How many times can the battery pack be recharged ?
It can be fully charged and discharged about 500 times under normal temperatures.
If the ▭ mark blinks rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Temperatures during charging
Lower temperatures require a longer charging time. Charging under temperatures ranging from 10°C to 30°C is recommended.

(D-1)



(D-2)



(D-3)

Preparing your camcorder 2

Setting the Date and Time

Inserting the Lithium Battery

(D-1)
This camcorder uses a lithium battery to activate the clock and to keep a title and birth dates in camcorder's memory. Before operating it for the first time, install the supplied lithium battery.

1 **Open the cover of the lithium battery compartment on the bottom.**

2 **Install the supplied CR2025 lithium battery with the + side facing out.**

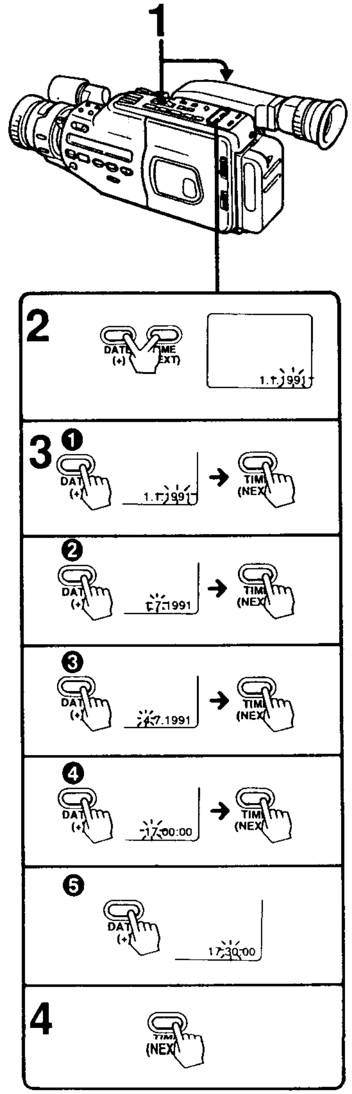
3 **Close the cover.**

To remove the lithium battery (D-2)
Press the side of the battery in the direction as indicated for installation.

Note on lithium battery life
The battery will last for approximately 1 year in normal operation.
When the lithium battery becomes weak, the ⊲ indication will blink on the viewfinder screen for about 5 seconds (when POWER is set to CAMERA) **(D-3)**.
In this case, **replace the battery with a Sony CR2025.**
Use of any other battery may present a risk of fire or explosion.
While replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, readjustments of the date, time, title and birth dates are necessary.

Cautions
- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

(D-4)



Setting the Date and Time

(D-4)
Make sure that a power source and lithium battery are attached.

1 **Set POWER to CAMERA, and slide STANDBY up.**

2 **Press DATE (+) and TIME (NEXT) simultaneously for more than one and a half seconds until the date indication appears in the viewfinder.**
DATE now functions as **+** (to advance numbers) and TIME functions as NEXT (to execute).

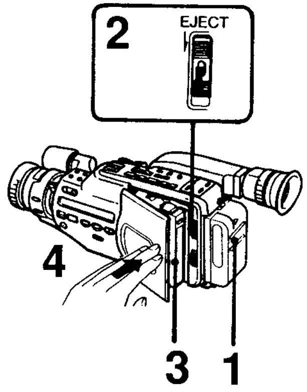
3 **Adjust the year, month, day, hour and minute, in that order.**
First adjust the blinking digits with **+**, and then press NEXT.
- When you keep DATE (+) pressed, the digits advance faster.
- The year starts at 1991, and proceeds as follows:
  1991 ---> 1999 → 2000 ---> 2020

4 **Press NEXT to set the second.**
The clock starts operating.

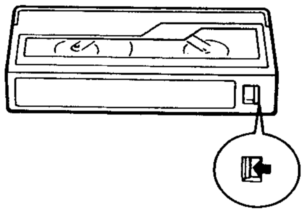
To correct date and time setting
Repeat steps 2 to 4.

To check the preset date and time
Press DATE or TIME. When you press the same button again, the indication goes off.

(E-1)



(E-2)



Preparing your camcorder 3

Inserting a Tape

Inserting a Tape

(E-1)

1 **Make sure that a power source is connected.**

2 **While pressing the small blue button, push EJECT in the direction of the arrow.**
The cassette holder opens.

3 **Insert a tape with the window facing outside.**

4 **Press the PUSH mark to close the cassette holder.**

Ejecting the Tape

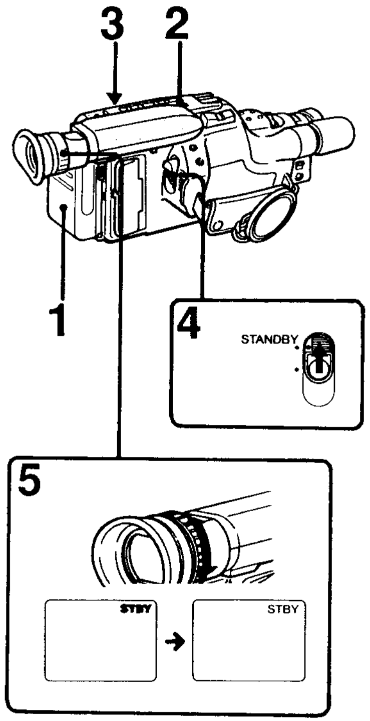
1 Make sure that a power source is connected.
2 While pressing the small blue button, push EJECT in the direction of the arrow.
3 Take out the tape and press the PUSH mark to close the cassette holder.

Preventing Accidental Erasure

(E-2)
Slide the tab on the cassette to expose the red mark. This will prevent accidental recording.
To re-record on this tape, slide the tab back out covering the red mark.
If you try to record with the red mark exposed, the ⊠ and ⏏ indications blink in the viewfinder and beeps sound for about 5 seconds.

Notes on handling tapes
- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the type of tape, thickness of tape, or if red mark is exposed or coverd, etc.
- Store tapes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.

(F)



Preparing your camcorder 4

Adjusting the Viewfinder Lens

The position of the viewfinder lens for optimum vision varies depending on the person. Adjust when using for the first time, or when using after someone else. (F)

1 **Make sure a power source is connected.**

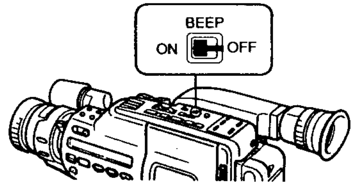
2 **While pressing the green button, set POWER to CAMERA.**

3 **Insert a cassette.**

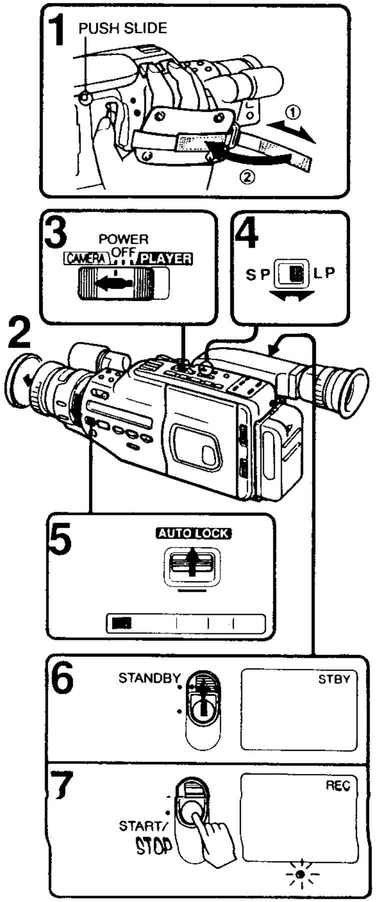
4 **Slide STANDBY up.**

5 **Turn the viewfinder lens adjustment ring so that the "STBY" displayed on the viewfinder screen comes into sharp focus.**

(G-1)



(G-2)



Recording a Picture Using Automatic Adjustments

Before recording "once-only" events, we strongly recommend making a trial recording and checking that everything is working perfectly.

Start Recording.

Make sure BEEP is set to ON. Beep will sound when you start and stop recording. **(G-1)**

(G-2)

1 **Hold the camcorder as in the figure.**
(Put your hand through the grip belt and make sure that your finger can easily touch START/STOP.)
If your nose touches the camcorder, press PUSH SLIDE and adjust the position and angle of the viewfinder.

2 **Remove the lens cap and attach it to the grip strap.**

3 **While pressing the green button, set POWER to CAMERA.**

4 **Set REC MODE to LP (long play) or SP (standard play), according to the length of your planned recording.**

5 **Set AUTO LOCK to the green position and turn the zoom lever downwards.**

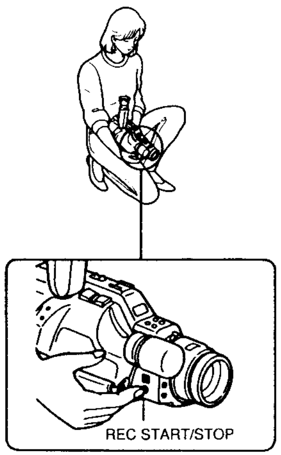
6 **Slide STANDBY up.**
"STBY" appears in the viewfinder. The camcorder is now in standby mode.
Focus is adjusted automatically. Do not turn or stop the focus ring forcibly.

7 **Press START/STOP.**
A beep sounds. "REC" appears and the red lamp lights up in the viewfinder and the camera recording/battery lamps light on the camcorder. The camcorder is now recording.

To standby (to stop momentarily)
Press START/STOP again.
Two beeps sound and "STBY" appears in the viewfinder.

To stop
Slide STANDBY down and set POWER to OFF.

(G-3)



For low-position recording (G-3)
The viewfinder can be turned 90 degrees up.
Press REC START/STOP in front of the camcorder.
To stop recording, press it again.

About the sports finder
This camcorder is equipped with the sports finder. As the focul length of this finder is long, you can monitor the picture while being away from the eyecup.

Using the BEEP switch
Normally set BEEP to ON.
It beeps when you start and stop recording, and if any difficulty should arise during operation.
If you want to deactivate the beeps, set BEEP to OFF.

Notes
- Beeps are not recorded on the tape.
- For warning beeps, see the back cover.

If the tape reaches near the end during recording
The ▭ indication in the viewfinder and the camera recording/battery lamps on the camcorder blink slowly.
When the tape reaches its end, blinking becomes rapid and beeps sound for about 5 seconds (if BEEP is set to ON).

Notes on recording
- To record from the beginning of the tape, run the beginning of the tape for about 15 seconds before recording. This will avoid missing the starting point when the tape is played back.
- When moving from indoors to outdoors, or vice versa, slide STANDBY up and point the camcorder at a white object for about 10 seconds so that the white balance is properly adjusted.

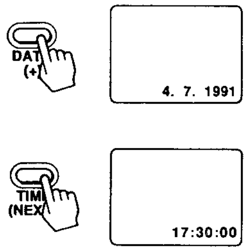
Note on standby
If you leave the camcorder in standby mode for 5 minutes or more, the camcorder will be automatically turned off. To resume standby mode, slide STANDBY down once and slide it up again.

Note on light sources
If you are shooting a subject in bright conditions just after shooting in a dark place, the picture may not appear in the viewfinder. In this case, point the camcorder to the other direction.

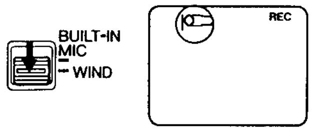
Recording mode
An 8 mm video format cassette records in the SP (standard play) mode and in the LP (long play) mode and can play back in the SP mode and LP mode.
The quality of the recording picture in the LP mode, however, will not be as good as that in the SP mode.

Note on PCM recording and playback
PCM recording or playback is not possible with this camcorder.
The PCM sound recorded or after-recorded with another video recorder cannot be played back with this camcorder.

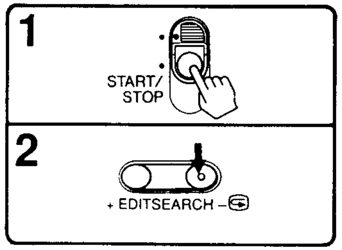
(G-4)



(G-5)



(G-6)



To Record the Date or Time

(G-4)

During camera recording or when in standby mode, press DATE for date indication or TIME for time indication.
The date or time displayed in the viewfinder is recorded with the picture.

To stop recording date or time
Press DATE or TIME again.
The picture recording continues.

When There is a Strong Wind

(G-5)

Set BUILT-IN MIC to WIND.
The noise from the wind will reduce.
After recording, set it to the upper position (green mark).

To Check the Last Portion of the Previous Recording

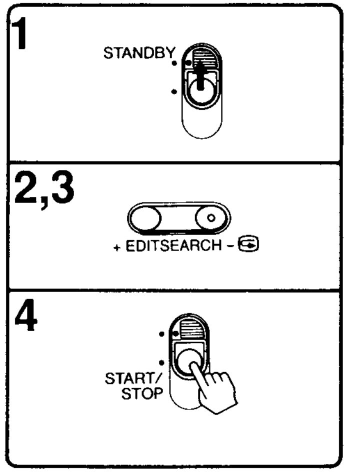
(G-6)

1. **Set the camcorder in standby mode by pressing the START/STOP button.**

2. **Press the – side of EDITSEARCH (⊖) momentarily.**
   The last few seconds of the recorded portion are rewound and then the recorded picture appears in the viewfinder. After a few seconds of playback, the camcorder goes back to standby mode.

If the picture has not been recorded
The video heads may be contaminated. Clean the heads using the Sony V8-25CLH video head cleaning cassette or equivalent.

(G-7)


1
STANDBY
2,3
+ EDITSEARCH -
4
START/
STOP

To Re-record on a Previously Recorded Portion during Recording

(G-7)

1 **Slide STANDBY up.**

2 **Look in the viewfinder and find the point from where you want to begin the recording:**
Keep pressing the + side of EDITSEARCH to advance the picture at a normal playback speed, or the – side to reverse the picture.

3 **At the desired point, release EDITSEARCH.**

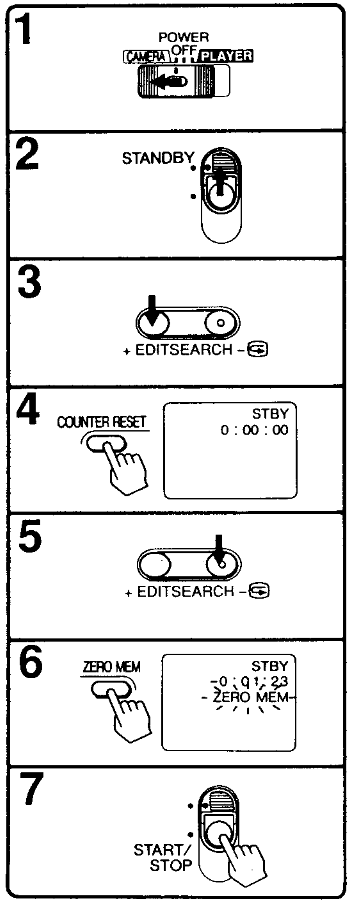
4 **Press START/STOP.**
A beep sounds and the recording begins.

To pause
Press START/STOP again.

To stop
Slide STANDBY down.

A smooth transition between scenes can be made even if STANDBY is slid down and slid up, or even if the power is turned off and on again, provided that the tape is not removed.

(G-8)


1
POWER
OFF
CAMERA
PLAYER
2
STANDBY
3
+ EDITSEARCH -
4
COUNTER RESET
STBY
0 : 00 : 00
5
+ EDITSEARCH -
6
ZERO MEM
STBY
-0 : 01 : 23
- ZERO MEM-
7
START/
STOP

To Re-record a Picture in the Middle of a Recorded Tape (Insert Recording)

(G-8)

1 **While pressing the green button, set POWER to CAMERA.**

2 **Slide STANDBY up to set the camcorder to standby mode.**

3 **While looking in the viewfinder, keep pressing the + or – side of EDITSEARCH and release the button where you want to end the insertion.**
The camcorder is set to standby mode.

4 **Press COUNTER RESET.**
The counter is reset to zero.

5 **While looking in the viewfinder, keep pressing the – side of EDITSEARCH and release the button at the point where you want to start the insertion.**

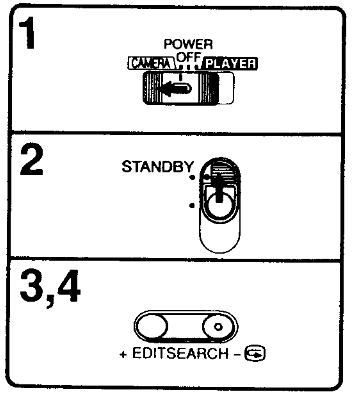
6 **Press ZERO MEM.**
The insert ending point is stored in memory.

7 **Press START/STOP.**
A beep sounds and insert recording begins. The insert recording stops automatically near the counter zero point.

To cancel the ZERO MEM
Press ZERO MEM.

Note
The picture may be distorted at the ending point when played back.

(G-9)



Playing Back Your Picture Instantly

(G-9)
You can check the recorded picture in the viewfinder. However, you cannot monitor the sound.

1 **While pressing the green button, set POWER to CAMERA.**

2 **Slide STANDBY up.**

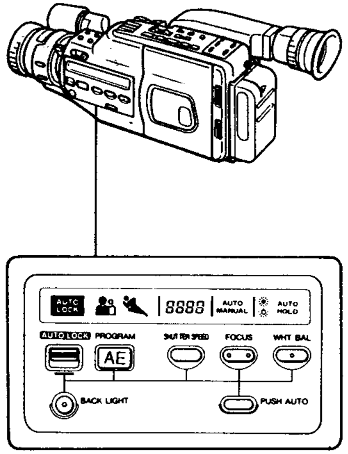
3 **Keep pressing the – side of EDITSEARCH to view the playback picture in reverse.**

4 **Keep pressing the + side of EDITSEARCH to view the playback picture.**

To stop playback, release EDITSEARCH.

To monitor the sound while viewing the playback picture in the viewfinder
1. Connect an earphone to the ● jack.
2. While pressing the green button, set POWER to PLAYER.
3. Press ◀◀ to rewind the tape and press ☐ where you want to stop.
4. Press ▷ to start playback.

(H)



Selecting the Automatic/ Manual Adjustment

When you set AUTO LOCK to the green position, focus, white balance, and iris are adjusted automatically and the shutter speed is set to 1/50. The automatic function offers you worry-free operation under most shooting conditions. But under certain circumstances, manual adjustment is better for effective recording. For manual adjustment, set AUTO LOCK to the lower position and select an appropriate setting. **(H)**

To adjust each item manually, see the page as shown in the table.

Item	See page
Focus	30, 31
White balance	32, 33
Shutter speed	34
Iris	35

PROGRAM AE function:
In addition to the above items, when you use the PROGRAM AE (Auto Exposure) function under the manual mode, you can get a scene like a portrait or clear picture in the still and slow motion playback. (See pages 36 and 37.)

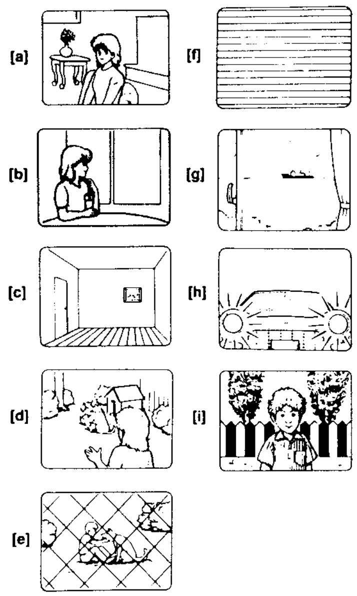
Push Auto:
During recording with manual focusing, as long as you keep this button pressed, autofocusing is activated.

When you attach the battery at the first time
The white balance, focus and iris are automatically adjusted and the shutter speed is set to normal speed (1/50) regardless of the position of AUTO LOCK.

Notes
- As long as you do not remove the battery, even if you set POWER to OFF, the previous settings are stored.
- If you set AUTO LOCK to the green position after you have made a manual adjustment and reset it to the lower position, the previous settings for manual adjustment will be later recalled.

Manual Focusing

(I-1)



When you set AUTO LOCK to the green position and set the subject to the center of the viewfinder, the autofocusing functions and you can easily get a focused picture under most shooting conditions. But manual focusing is recommended in the following cases.
[a] to [i] correspond to the illustrations. **(I-1)**

[a] Insufficient light
[b] Too much brightness behind the subject
[c] Subjects with little contrast–wall, sky, etc.
[d] One subject is close; the other is in the center, but at a distance
[e] Subjects beyond nets, etc. or another subject passes in front of the camcorder
[f] Horizontal stripes
[g] Subject through frosted glass
[h] Bright subject or subject reflecting light
[i] High contrast behind the subject (The background may be focused.)
[j] Under the following circumstances

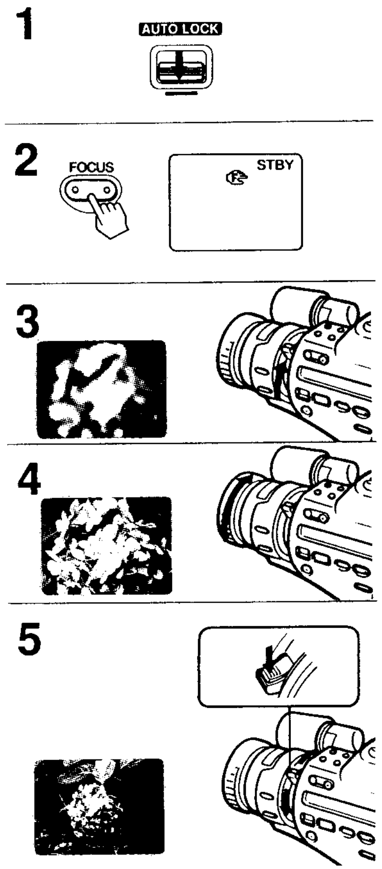
- When you use conversion lenses or effect filters
- When shooting a stationary subject using a tripod
- To save battery wear

Autofocusing does not function momentarily when:

- The setting of the shutter speed is changed.
- Backlight is adjusted manually.
- Lighting conditions change quickly.
- Zooming is changed from wide-range to telephoto.

This camcorder keeps in focus by referring to the picture contrast, which is weak in the above situations.

(I-2)



Focusing Manually

(I-2)

1 **Set AUTO LOCK to the lower position.**

2 **Press FOCUS.**
Make sure the (manual focusing) indication appears in the viewfinder. If it does not appear, press the button again.

3 **Turn the manual zoom lever fully to the telephoto position.**

4 **Turn the focus ring to achieve sharp focus.**

5 **Set the desired shot length using the manual zoom lever, while pressing the gray button on it.**

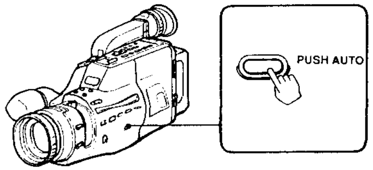
Shooting with autofocusing momentarily (I-3)

While shooting with manual focusing, press PUSH AUTO. The autofocusing functions while you are pressing the button. When you release the button, manual focusing will be resumed. Use this button when you change the focus from one subject to another. The focusing performs naturally.
The previous settings except for focusing are retained.

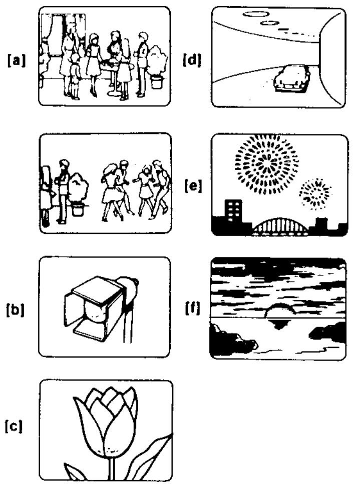
Some helpful hints

- When shooting in relatively dark places such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles after focusing in telephoto.
- When shooting a scene with lots of movement in bright light, set the zoom lever to the wide-angle position and the focus ring to 2 to 3 m.

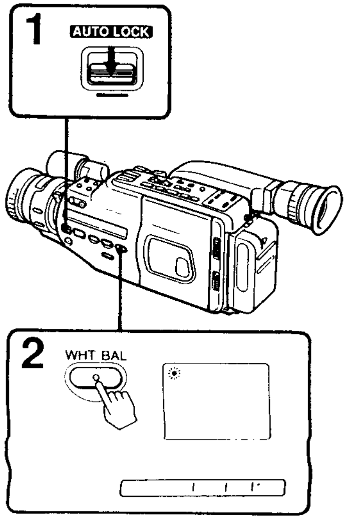
(I-3)



(J-1)



(J-2)



Adjusting the White Balance

When you set AUTO LOCK to the green position, the auto white balance function of this camcorder adjusts the picture to natural colours under most shooting conditions. However, in the conditions listed below, adjust the white balance manually.
[a] to [f] correspond to the illustrations. **(J-1)**

	Conditions	Indication in the viewfinder
[a]	Lighting conditions change quickly	💡
[b]	Too bright, such as in photograph studios	💡
[c]	Monochromatic subject or background	HOLD
[d]	Under a sodium lamp	💡
	Under a mercury lamp	
	Under a colour matching fluorescent lamp	☀
[e]	Recording outdoors: a night view, neon signs or fireworks	
[f]	Recording outdoors: scenes after sunset or before sunrise	

Adjusting the White Balance Manually

(J-2)

1 Set AUTO LOCK to the lower position.

2 Select the desired white balance mode by pressing WHT BAL.
Each time you press the button, the indication changes as follows.

→ No indication → HOLD → ☀ → 💡 ┐

Note on manual adjustment
When moving from indoors to outdoors, or vice versa, set AUTO LOCK to the green position and then reset to the lower position again.

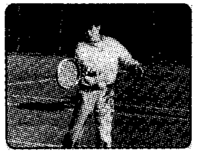
What is the HOLD mode?
In the HOLD mode, the camcorder automatically adjusts to the colour temperature of the subject's light source and keeps that temperature during recording. When recording some subjects with different colour temperatures, use the HOLD mode to set a colour temperature and you can achieve a recording with natural colours without being affected by the surroundings.

To set into the HOLD mode

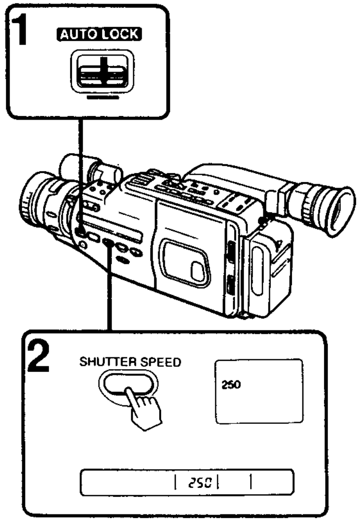
1. Set AUTO LOCK to the lower position and press WHT BAL to set to Auto (no indication).
2. Point at and record a white, flat object such as a white wall, or paper.
3. Press WHT BAL.
   The HOLD mark appears in the viewfinder.

When you change the battery pack or the light source is changed, you need to set into the HOLD mode again. In this case, follow the procedures above again.

(K-1)



(K-2)



Setting Shutter Speed

(K-1)
When you record a fast-moving subject, increase the shutter speed so that you can see the clear picture in the playback pause mode.
Also, the depth of field in proper focus becomes shallow at a high shutter speed. This is effective to record the main subject in sharp focus and the surroundings of focus.
When recording at a high-speed shutter setting, record in a brighter place than usual.

Recommended setting for your situation

Example use	Recommended shutter speed
• On clear days, recording golf or tennis swing (To view the hit ball clearly in the still picture mode, set to 1/4000.) • Recording skiers	1/4000 or 1/2000
• On overcast days, recording a moving merry-go-round or roller coaster • Recording outdoors from inside a vehicle (for stable shooting)	1/1000 or 1/250
• Instead of the ND2 filter (To reduce the exposure level to about a half) • Recording indoor sports (for stable shooting)	1/120

Selecting the Shutter Speed

(K-2)

1 **Set AUTO LOCK to the lower position.**

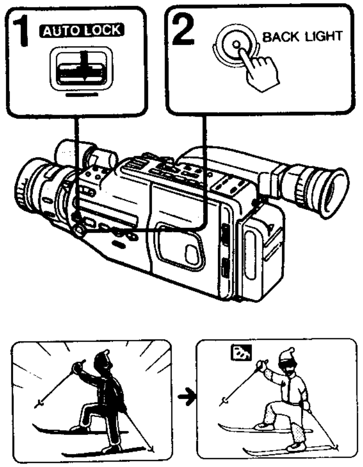
2 **Press SHUTTER SPEED repeatedly until the desired shutter speed indication appears.**
Each time you press the button, the indication changes as follows.

→ No indication (1/50) → 120 (1/120) → 250 (1/250) ↓
4000 (1/4000) ← 2000(1/2000) ← 1000(1/1000) ←

Notes

- When you select shutter speed 1/250 or faster, record under sunlight or use a video light.
- When you shoot a very bright subject at a faster shutter speed, a light vertical, belt-like line ("smear") may appear on the screen.
- When you record at certain shutter speeds under a light discharged tube, such as a fluorescent lamp, sodium lamp or mercury lamp, the brightness of the recorded picture may vary.

(L)



Shooting with Backlighting

In this camcorder, the iris is automatically controlled. However, when shooting a subject that is backlit, that is, if the light source is coming in from the back of the subject, use the BACK LIGHT button. (L)

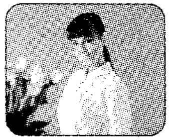
1 **Set AUTO LOCK to the lower position.**

2 **Press BACK LIGHT.**
The ▣ indication appears. If it does not appear, press the button again.

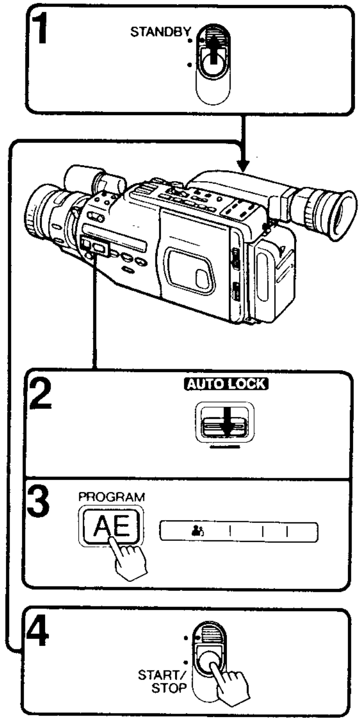
After shooting, be sure to release this adjustment condition by pressing BACK LIGHT again. (The ▣ indication goes out.)
Otherwise, the recorded picture will become too bright.

Using the PROGRAM AE button

(M-1)



(M-2)



Using the Portrait Mode

(M-1)
In the portrait mode, the object is in focus and the background is out of focus. The opening of the iris and the shutter speed is automatically adjusted to maintain the appropriate exposure according to the size and brightness of the object. The portrait mode is most effective to be used outdoors.

Use the portrait mode when shooting the following subjects:
- a still subject such as person or flower
- zooming in a subject in the telephoto mode
- subjects beyond obstacles such as net

How to set to portrait mode (M-2)

1 **Slide STANDBY up.**

2 **Set AUTO LOCK to the lower position.**

3 **Press PROGRAM AE until 👤 appears in the display window and the viewfinder.**

4 **Press START/STOP.**
Recording with the portrait mode starts.

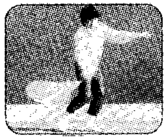
To resume the automatic mode
Press PROGRAM AE until neither 👤 nor 🏃 appears in the display window and the viewfinder or set AUTO LOCK to the green position.

Hint for effective camera work
Use of the portrait mode in the following method will gradually bring the background out of focus while keeping the object in focus.

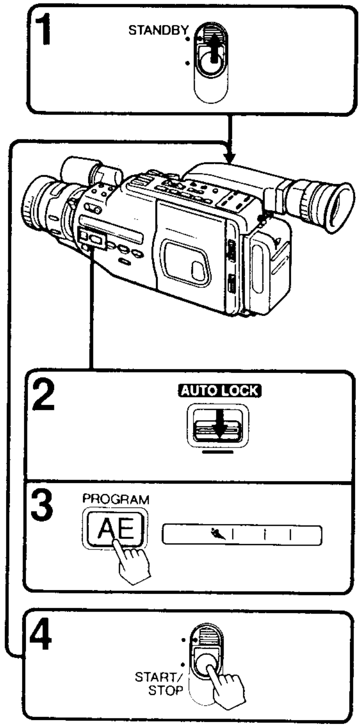
1 Enter the portrait mode.
2 Set AUTO LOCK to the green position and start recording.
3 Set AUTO LOCK to the lower position.
The camcorder will enter the portrait mode and brings the background out of focus.

Note
When recording under fluorescent, sodium, or mercury lamp, the brightness of the recorded picture may flicker, or the colour of the recorded picture may become unnatural.

(M-3)



(M-4)



Using the Sports Mode

(M-3)
In the sports mode, the shutter speed and the opening of the iris are automatically adjusted to maintain the appropriate exposure according to the speed of the object. An object moving in high speed can be recorded and the picture can be observed more clearly with less picture shaking in the still or slow mode. The sports mode provides more effective recording than you can achieve by using SHUTTER SPEED.

You may want to use the sports mode when shooting the following subjects:
- outdoor sports scene such as football, tennis, or golf
- recording a landscape in the running car

How to set to sports mode (M-4)

1 **Slide STANDBY up.**

2 **Set AUTO LOCK to the lower position.**

3 **Press PROGRAM AE until 🏃 appears in the display window and the viewfinder.**

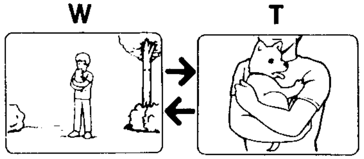
4 **Press START/STOP.**
Recording with the sports mode starts.

To resume the automatic mode
Press PROGRAM AE until neither 👤 nor 🏃 appears in the display window and the viewfinder or set AUTO LOCK to the green position.

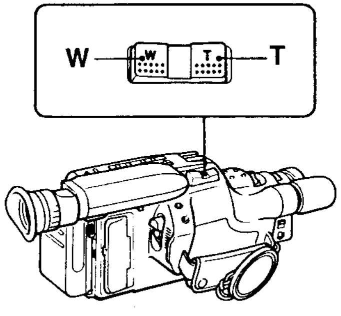
Hint for effective camera work
When shooting athletic matches from a distant, such as a football game, we tend to zoom from the wide to the telephoto position to catch the once-only events. Even under these circumstances, by using the sports mode, a sharp picture can be obtained when played back later in the slow or still mode.

Notes
- The sports mode is effective under sufficient lighting, such as under sunlight. When used under extremely dark conditions, the shutter speed may not be shifted to high speeds.
- When recording under fluorescent, sodium, or mercury lamp, the brightness of the recorded picture may vary, or the colour of the recorded picture may become unnatural.

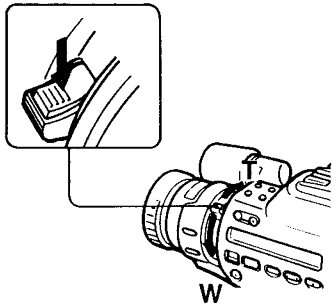
(N-1)



(N-2)



(N-3)



Zooming

The size of the subject in the scene can be changed. Use "zoom-in" for dramatic close-ups. Use "zoom-out" for panoramic long shots. Also use zooming to focus manually or to decide the shooting angle. **(N-1)**

Power Zooming

— for smooth and constant zooming (N-2)

Press the T side of the power zoom button for telephoto (subject appears closer) and the W side for wide-angle (subject appears farther away).

Zooming Manually

— for creating a dramatic effect (N-3)

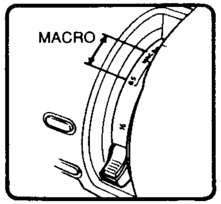
Turn the manual zoom lever upward for telephoto and downward for wide-angle.

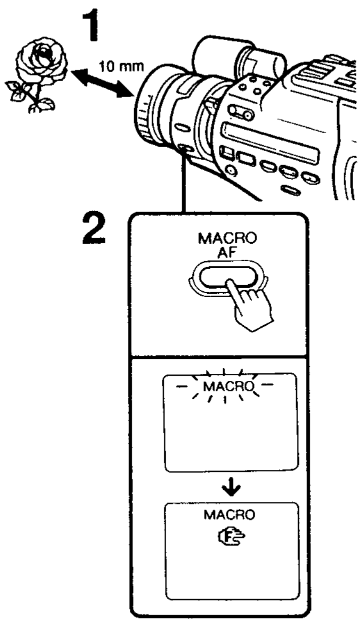
Be sure to keep pressing the button on the lever when turning it downward.

Focal length of this camcorder
The focal length is 8.5 mm to 68 mm. This means approximately 46 mm to 368 mm converted into the focal length of a 35-mm still camera.

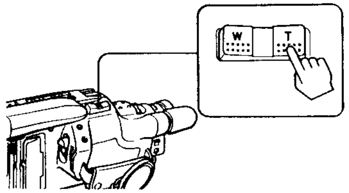
When shooting with autofocusing
When you set the zoom lever to the wide angle position, the focus ring will be fixed around the 2 m position and may not exactly match the actual object-to-camera distance.

(O-1)





(O-2)



Close-up (Autofocusing in Macro)

Even small subjects, such as flowers, insects, images in photographs, can literally fill the screen with autofocusing in macro. **(O-1)**

1 **Bring the camcorder as close as necessary to obtain the desired subject size.**
The subject can be as close as a minimum of 10 mm from the lens surface.

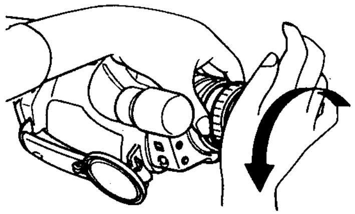
2 **Press MACRO AF.**
(1) The MACRO indication blinks in the viewfinder and the zoom lever turns automatically to the MACRO range.
(2) The MACRO indication lights steadily and the Ⓕ indication appears when sharp focus is achieved automatically.

To release this adjustment setting
Press the T side of the power zoom button or return the zoom lever to the ordinary range. **(O-2)**

If the MACRO indication lights steadily before getting sharp focus
The MACRO indication lights steadily if you cannot get sharp focus within 30 seconds. In this case, press MACRO AF again to re-function autofocusing in macro.
If you still do not get a sharp focus, manual focusing is recommended (page 31). Adjust it after the MACRO indication lights steadily.

To keep autofocusing active
Keep MACRO AF pressed.
Contrary to the normal autofocusing (page 22), autofocusing in macro is released each time the sharp focus is achieved.

(O-3)



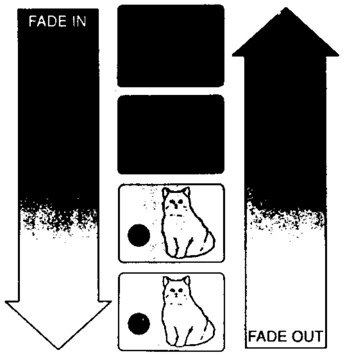
Notes
- This function has no connection with the AUTO LOCK switch. You can use autofocusing in macro while manually adjusting the ordinary focus, etc.
- Do not press the power zoom button while the zoom lever is moving for autofocusing in macro. Otherwise, autofocusing is released.

Manual focusing in macro
1 Turn the zoom lever to the MACRO range without pressing the button on it.
The MACRO indication lights up in the viewfinder.
2 Turn the zoom lever within the MACRO range to focus sharply.

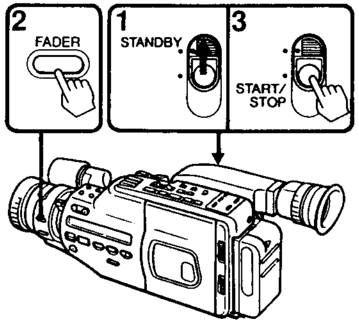
If the lens hood touches the subject
Remove the lens hood.
Hold the focus ring and turn the hood by pressing it with your palm. **(O-3)**
Do the same when attaching/removing an optional filter or conversion lens.

Recommended accessory
When shooting in macro, the depth of field is very shallow, so pay attention to focusing. To keep the subject in focus, use a tripod.

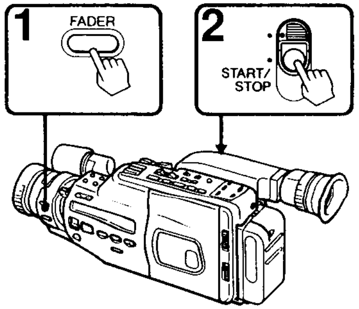
(P-1)



(P-2)



(P-3)



Fade-in and Fade-out

You can fade-in or fade-out to give your recording a preofessional appearance.
When fading-in, the picture will gradually appear from black. The sound will also gradually increase.
When fading-out, the picture will gradually fade to black. The sound will decrease. **(P-1)**

To Fade-in

(P-2)
1 **Slide STANDBY up to set the camcorder in the standby mode.**

2 **Press FADER.**

3 **Press START/STOP.**
Fade-in is performed and recording will start.

To Fade-out

(P-3)
1 **While recording, press FADER.**

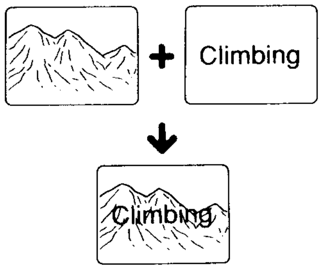
2 **Press START/STOP to stop the recording.**
Fade-out is performed and then recording stops.

To cancel the fade-in/fade-out function
Before pressing START/STOP, press FADER again.

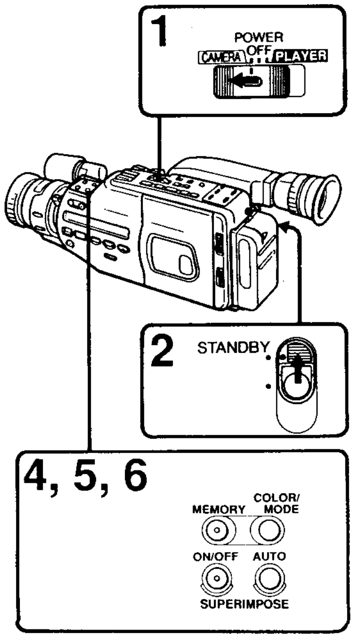
If you want to use the fade-in/fade-out function repeatedly
Start from step 1 each time.

When the date/time (page 25) or age (page 50) is displayed
The date/time or age does not fade-in or fade-out.

(Q-1)



(Q-2)



Superimposing a Title

You can superimpose your own hand-lettered message or illustration (title) over the picture during recording or playback (editing). **(Q-1)**

Before recording, store a title.

Storing a Title (Q-2)

Before storing

- Make a desired title card.
  Use a plain, white card and draw a title with a dark colour in thick letters.
- You can choose from 8 colours for your title.
- Make sure the lithium battery is installed. (page 18)

How to store

1 **While pressing the green button, set POWER to CAMERA.**

2 **Slide STANDBY up to set the camcorder in the standby mode.**

3 **Point the camcorder to the title card and adjust the focus.**
To focus the subject, use the close-up function.

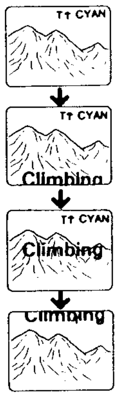
4 **Press MEMORY to store the title.**

5 **Press COLOR/MODE and select the title colour.**
Each time you press the button, the indication changes as follows.
WHT (white) → BLUE → GRN (green) → CYAN → RED
↑ BLK (black) ← YEL (yellow) ← VIO (violet) ←

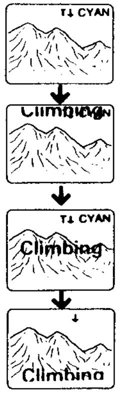
6 **Press ON/OFF to turn off the title.**

To check the title
Press ON/OFF in the standby mode.
To turn off the title, press the button again.

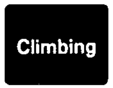
(Q-3)



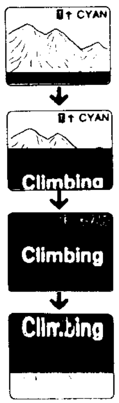
(Q-4)



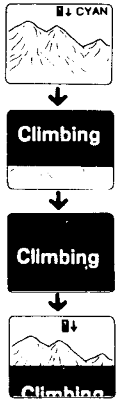
(Q-5)



(Q-6)



(Q-7)



Various Display Modes of the Title

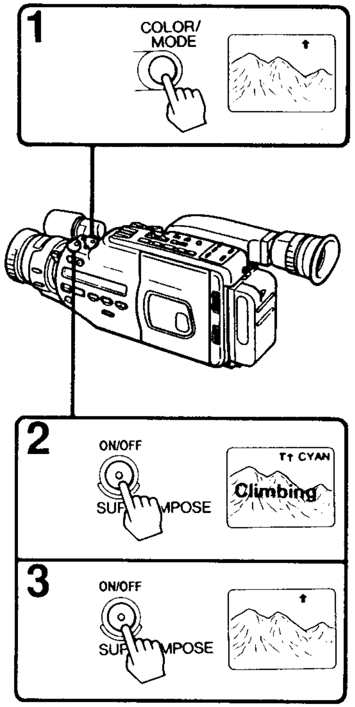
You can scroll your title up or down, or reverse the title.
Select the display mode of the title from the following table.

Display mode	Indication in the viewfinder
Scrolling up the tile (Q-3) The title scrolls up and stops at the center.	↑
Scrolling down the title (Q-4) The title scrolls down and stops at the center.	↓
Reversing the title with the picture (Q-5)	▯
Scrolling up the reversed title (Q-6)	▯↑
Scrolling down the reversed title (Q-7)	▯↓
Normal display mode	No indication
Auto-superimposing	└ AUTO

Note on scrolling
You can scroll the title only when the camcorder is in the recording standby, recording, or normal playback mode. In the other modes (see "Various Playback Modes" on page 56), you can select only reversing (▯) or normal display mode. Also scrolling will be cancelled when you set the camcorder in the other modes after selecting scrolling.

About memory back up
The camcorder uses the lithium battery on the bottom to keep the title in memory. The lithium battery life is approximately 1 year.

(Q-8)



Superimposing a Title on Your Tape

The following shows how to superimpose a title using an example in which the title in cyan scrolls up. **(Q-8)**

1 Press COLOR/MODE to select the display mode of the title in the standby or playback pause mode.

2 Press ON/OFF at the point from which you want to insert the title in the standby mode, during recording, in the playback pause mode or during playback.
You can change the title colour by pressing COLOR/MODE.
Each time you press the button, the colour indication changes.

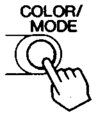
3 Wait for a while and press ON/OFF again.
The title goes out.

About the colour and the display mode indications
The colour and the display mode indications in the viewfinder are not recorded.

If you press EDITSEARCH during recording
The title goes out. After performing the editsearch or recording review function, the title appears again.

If you want to record the title during playback
Make connections for editing and record the title on another VTR. (See page 59.)

(Q-9)



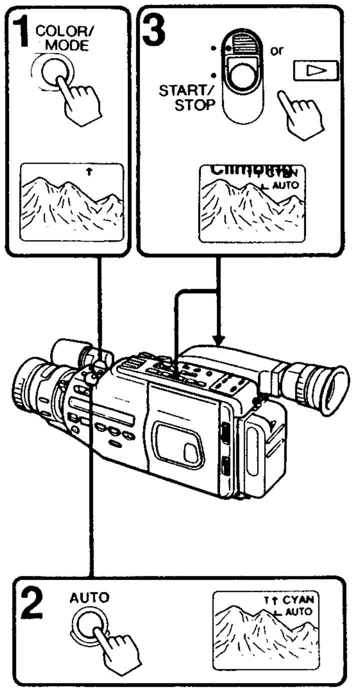
Function of the COLOR/MODE button
This button has a double function: one is to select the title colour and the other is to select the title display mode.
Its function depends on if the title is displayed or not. **(Q-9)**

To select the colour
1 Press ON/OFF to display the title.
2 Press COLOR/MODE.
Each time you press the button, the colour indication changes as follows:
WHT (white) → BLUE → GRN (green) → CYAN → RED
↑ BLK (black) ← YEL (yellow) ← VIO (violet) ←

To select the display mode
1 If the title is displayed, press ON/OFF so that the title disappears.
2 Press COLOR/MODE.
Each time you press the button, the display mode indication changes as follows:
No indication (normal mode) → ↑
↑ ▯↓ ← ▯↑ ← ▯ ← ↓ ←

↑ : Title scroll up mode
↓ : Title scroll down mode
▯ : Title reverse mode
▯↑ : Title reverse and scroll up mode
▯↓ : Title reverse and scroll down mode

(Q-10)

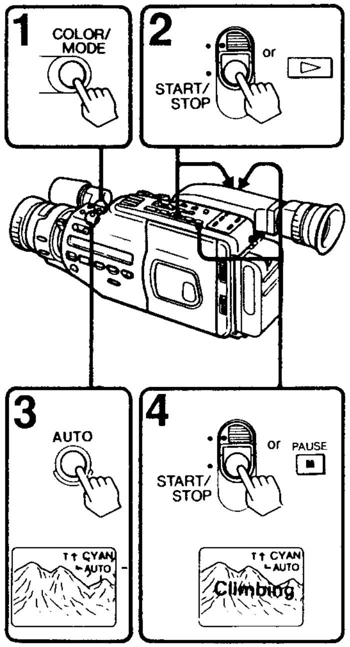


Superimposing a Title at the Beginning

You can clear the title automatically after displaying it for a few seconds. (Auto-superimposing) **(Q-10)**

1. **Press COLOR/MODE to select the display mode of the title in the standby or playback pause mode.**
2. **Press AUTO.**
3. **Start recording or playback.**
   The title is displayed in the selected mode and disappears after a few seconds.

(Q-11)



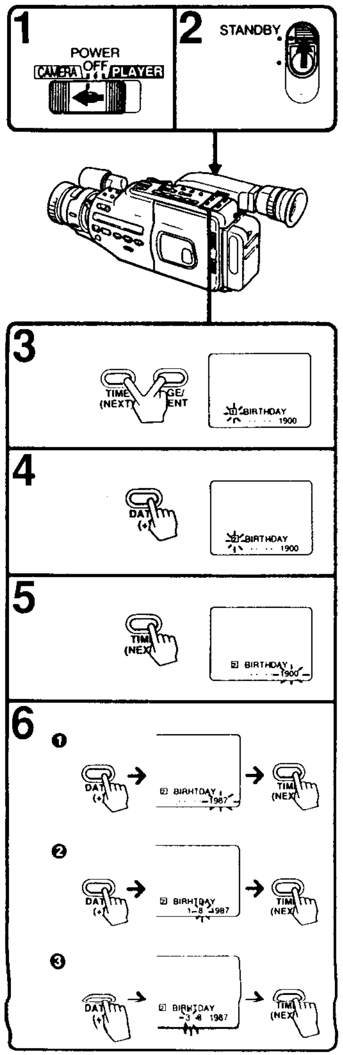
Superimposing a Title Before the Tape Stops

You can display the title automatically for a few seconds after you press START/STOP or **II** PAUSE to stop recording or playback. (Auto-superimposing) **(Q-11)**

1. **Press COLOR/MODE to select the display mode of the title in the standby or playback pause mode.**
2. **Start recording or playback.**
3. **Press AUTO.**
4. **Press START/STOP or II PAUSE at the point which you want to stop recording or playback.**
   After the title is displayed for a few seconds, recording or playback stops.

The auto-superimposing is cancelled when:
- The auto-superimposing is performed once.
- You press AUTO again before the superimposing is performed.
- You perform other operations (e.g. editsearch or various speed playback) in the standby or playback pause mode.
- You press ON/OFF before superimposing is performed.

(R-1)


1
POWER
CAMERA OFF PLAYER
2
STANDBY
3
TIME (NEXT)
AGE/ EVENT
BIRTHDAY 1900
4
DATE (+)
BIRTHDAY 1900
5
TIME (NEXT)
BIRTHDAY 1900
6
❶
DATE (+)
BIRTHDAY 1987
TIME (NEXT)
❷
DATE (+)
BIRTHDAY 1-8 1987
TIME (NEXT)
❸
DATE (+)
BIRTHDAY 3 8 1987
TIME (NEXT)

Recording the Age of Your Child

You can record the age (in years and months) of your child, by storing his/her birth date in your camcorder.
Once you store your child's date of birth, your child's age is automatically updated and displayed by pressing a single button. In this way, you can make a record of your child's development.
Besides age, you can also store the date of a specific event, and record how many years and months have passed since then.
You can record up to three ages or events.

Storing the Birth Date/Event Date

Before you begin
Before you store a birth date in your camcorder, make sure that power source is connected, that the lithium battery is installed and that the date is correctly set.

How to store (R-1)
Example: Store "3.8. 1987" in memory 2.

1 **Set POWER to CAMERA while pressing the green button.**

2 **Slide STANDBY up.**

3 **Press AGE/EVENT and TIME (NEXT) simultaneously for more than one and a half seconds until "[1] BIRTHDAY -- -- 1900" appears and [1] blinks in the viewfinder.**

4 **Press DATE (+) to select [2].**
Each time you press DATE (+), the display changes as follows:

[1] BIRTHDAY → [2] BIRTHDAY
↑ [3] EVENT ←

Although "EVENT" is displayed on [3], you can use it for age as well. [1] and [2] can also be used for event.

5 **Press TIME (NEXT).**
The "1900" indication blinks.

6 **Enter the birth date.**
First adjust the blinking digits with DATE (+), and then press TIME (NEXT).
The age is displayed when all the items are adjusted.

If you missed the desired number with DATE (+)
Keep pressing DATE (+). The number changes as follows:

Year: 1900 → 1901 ···→current year
↑ current year – (minus) 99 ←

Month: 1 → 2 ···→ 12 → -- --

Day: 1 → 2 ···→ 31

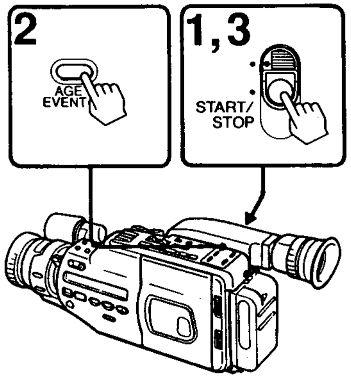
To correct/change the setting
Follow the procedure from step 1 again.

To advance the digits faster
Keep DATE (+) pressed.

To preset the year before 1900
1 After step 5 on page 48, keep pressing DATE (+) until the current year is displayed.
2 Press DATE (+) again.
The year goes back 99 years.
(example: 1991 → 1892)
3 Go to step 6.

When in 2000
"--.-- 1901" is displayed in step 3 on page 48. After that, it advances every year as "1902, 1903, ...".

(R-2)



Recording the Age

You cannot add the age later during playback or editing. Be sure to follow the procedure below. **(R-2)**

1 **During recording, press START/STOP at the point where you want to insert the age indication.**
The camcorder is set in the standby mode.

2 **Press AGE/EVENT to select the indication you want to record.**
Each time you press AGE/EVENT, the indication changes as follows:

→ No indication → [1] The first age
[3] The third age ← [2] The second age ←

An item with no presetting is skipped.
The [1], [2], or [3] indication goes out.

3 **Press START/STOP.**
Recording starts again.
The age displayed in the viewfinder is recorded with the picture.

To stop recording the age
Press AGE/EVENT until the indication goes out.

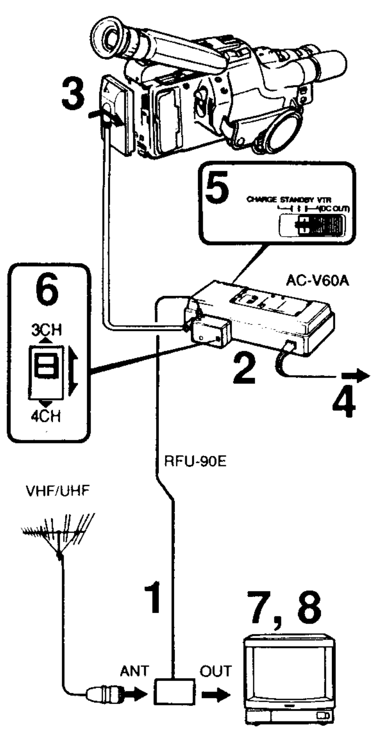
To change the display while recording
Press AGE/EVENT until the indication you want to record is displayed. Recording of the indication you selected starts when [1], [2], or [3] goes out.

To cancel the stored birth date/event date
1 Proceed steps 1 to 4 of "Storing the Birth Date/Event Date" on page 48 and select the item you want to cancel.
2 Press TIME (NEXT) twice.
"Month" blinks.
3 Press DATE (+) until "--.--" appears.
4 Press TIME (NEXT).
The birth date/event date is deleted from the memory and is not displayed when you press AGE/EVENT.

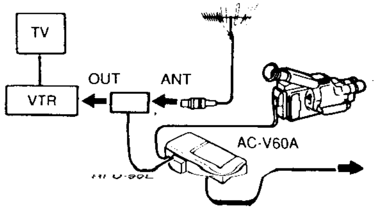
About memory back-up
The camcorder uses the lithium battery on the bottom to keep the birth date/event date in memory. The lithium battery life is approximately 1 year.

When you connect the camcorder to a TV
If you do not use the data-screen function, the age indication will appear on the TV screen when the [1], [2], or [3] indication goes out in the viewfinder and recording starts.

(S-1)



(S-2)



Connections for Playback

You can easily make a proper connection of the camcorder and TV by using the supplied AC-V60A AC power adaptor. Check the following connecting examples and go to the appropriate section to make the necessary connections.

Case 1: Connecting the camcorder directly to the TV without video/audio input jacks

Case 2: Connecting the camcorder directly to the TV with video/audio input jacks

Case 1: Connecting a TV without Video/Audio Input Jacks

For the customers supplied with the RFU-90E (S-1)

Before you begin
- Use the supplied RFU adaptor and AC power adaptor.
- Make sure that the TV is turned off.

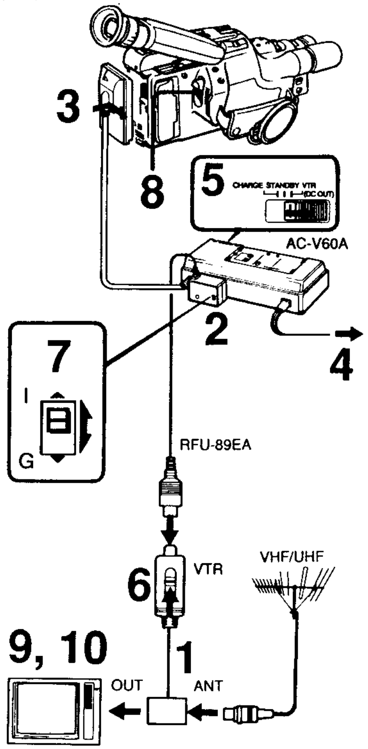
How to connect
1 Connect the antenna and TV to the RFU adaptor.
2 Connect the RFU adaptor to the AC power adaptor.
3 Attach the connecting plate of the AC power adaptor to the camcorder.
4 Connect the AC power adaptor to a wall outlet.
5 Set CHARGE/VTR of the AC power adaptor to VTR.
6 Select the RF unit selector of the adaptor to 3CH or 4CH, whichever is not active in your area.
7 Turn on the TV and select the 0 position.
8 Tune the TV so that you can get picture and sound from the camcorder.

Usually keep the AC power adaptor, the RFU adaptor and the TV connected.

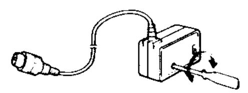
When you watch a TV programme
Set the CHARGE/VTR selector on the AC power adaptor to STANDBY or turn off the power of the camcorder.

If your TV is connected with a VTR (S-2)
Connect the camcorder to the VTR instead of the TV.

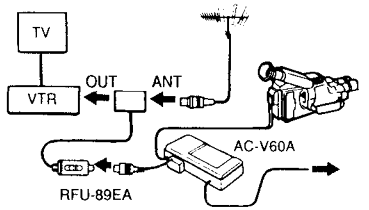
(S-3)



(S-4)



(S-5)



For the customers supplied with the RFU-89EA (S-3)

Before you begin
- Use the supplied RFU adaptor and AC power adaptor.
- Make sure that the TV is turned off.

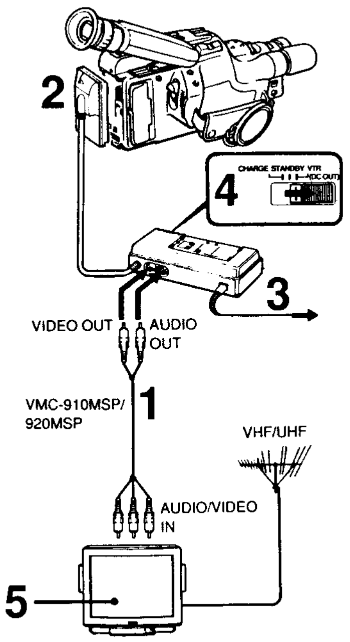
How to connect
1 Connect the antenna and TV to the RFU adaptor.
2 Connect the RFU adaptor to the AC power adaptor.
3 Attach the connecting plate of the AC power adaptor to the camcorder.
4 Connect the AC power adaptor to a wall outlet.
5 Set CHARGE/VTR of the AC power adaptor to VTR.
6 Set the selector switch of the aerial selector to VTR.
7 Set the I/G selector of the RFU adaptor according to the TV system of your country.
8 Set POWER of the camcorder to CAMERA, insert a tape and slide STANDBY up.
9 Turn on the TV and select a programme position that is not used to receive a TV station.
10 Tune the TV so that you can get picture and sound from the camcorder.

When the playback picture is not free of disturbance
1 Set the selector switch of the aerial selector to ANT.
2 Select programme position on the TV between UHF channels 30 and 39, so that the TV shows no picture and a steady rustling sound or no sound is heard.
3 Set the selector switch of the aerial selector to VTR.
4 Turn the RF channel setting screw of the RFU adaptor slowly with the supplied screwdriver so that playback picture is clearly displayed on the TV screen. **(S-4)**

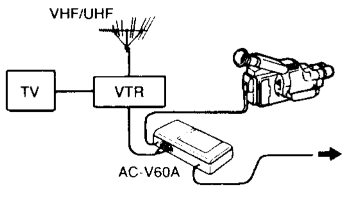
Usually keep the AC power adaptor, the RFU adaptor and the TV connected.

If your TV is connected with a VTR
Connect the camcorder to the VTR instead of the TV. **(S-5)**

(S-6)



(S-7)



Case 2: Connecting a TV with Video/ Audio Input Jacks

(S-6)

Before you begin

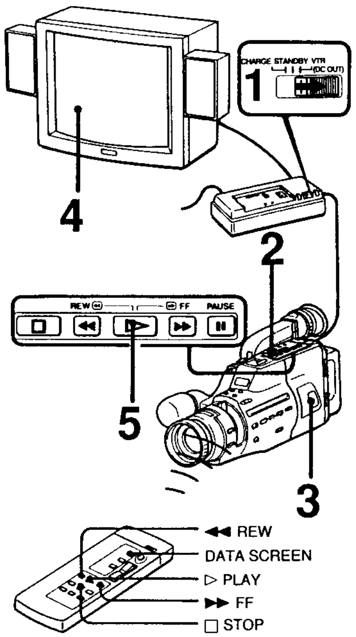
- Use the supplied AC power adaptor and appropriate A/V connecting cable.
- Make sure that the TV is turned off.

How to connect

1 Connect the AC power adaptor to the TV.
  Use an appropriate A/V connecting cable according to the connector type of your TV. Sony offers you the following cables (not supplied):
  [a] VMC-710MP/720MP: to phono and BNC-type
      If your TV has stereo type audio inputs, use VMC-910MSP/920MSP.
  [b] VMC-2104: to 21-pin (EUROCONNECTOR)
      If your TV has stereo type audio inputs, use VMC-2106.
2 Attach the connecting plate of the AC power adaptor to the camcorder.
3 Connect the AC power adaptor to a wall outlet.
4 Set CHARGE/VTR of the AC power adaptor to VTR.
5 Set the TV/VIDEO selector on the TV to VIDEO.

If your TV is connected with a VTR (S-7)
Connect the AC power adaptor to the VTR instead of the TV.

(T-1)



Playing Back a Tape

The supplied wireless Remote Commander is useful to control the camcorder from a distance. When using it, be sure to set the ■ REMOTE COMMANDER ON/OFF switch to ON.

(T-1)

1 Set CHARGE/VTR on the AC power adaptor to VTR.

2 Set POWER to PLAYER while pressing the green button.

3 Insert a tape.

4 Turn on the TV (or the VTR).
- For a TV with video/audio input jacks, set the TV/VIDEO selector to VIDEO.
- For a TV without video/audio input jacks, select the programme position for playing back the camcorder.

5 Press ▷.
Playback begins.

To stop playback, press □.

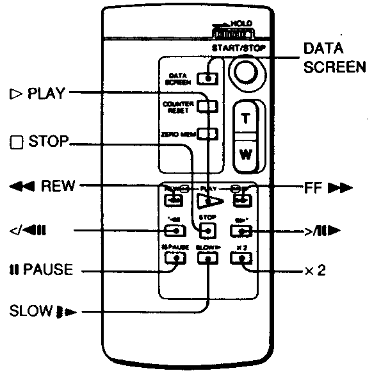
To rewind the tape, press ◀◀.

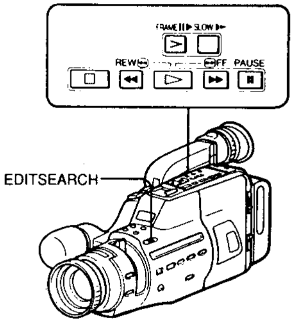
To advance the tape rapidly, press ▶▶.

To make the same indications in the viewfinder on the TV, press DATA SCREEN. To clear them, press it again.

After playing back
Set POWER on the camcorder to OFF and CHARGE/VTR on the AC power adaptor to STANDBY.

(T-2)





Various Playback Modes

(T-2)

To view the still picture (playback pause)
Press **II** PAUSE during playback.
II appears in the viewfinder.
To resume normal playback, press ▷ or **II**.
Note:
When the still picture mode lasts for 5 minutes or more, the camcorder automatically enters the stop mode.

To change the playback direction
Press </◀II for the reverse or >/II▶ for the forward direction during playback. > on the camcorder is only for the forward direction.
–x1 or x1 appears in the viewfinder.

To view the picture at 1/5 speed (slow playback)
Select the playback direction with </◀II or >/II▶, and then press SLOW I▶ during playback.
SLOW I▶ on the camcorder is only for the forward direction.
◀I or I▶ appears in the viewfinder.
To resume normal playback, press ▷.
Note:
When slow playback lasts for 1 minute or more, the forward or reverse playback at the normal speed starts automatically, depending on the tape direction.

To view the picture at double speed (only on the Commander)
Select the playback direction with </◀II or >/II▶, and then press ×2 on the Commander.
–×2 or ×2 appears in the viewfinder.
To resume normal playback, press ▷.

To view the picture frame-by-frame
In the still picture mode, press </◀II or >/II▶. Each time you press, the picture appears by a frame.
II▶ on the camcorder is only for the forward direction. ◀II or II▶ appears in the viewfinder.
If you keep pressing ◀II/II▶, playback at 1/25 speed starts.
To resume normal playback, press ▷.

To locate the desired scene (picture search)
Keep pressing ◀◀ or ▶▶ during playback or in the still picture mode. ◀◀ or ▶▶ appears in the viewfinder.
To resume normal playback, release the button.

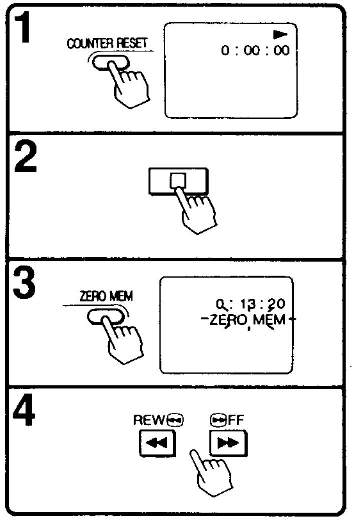
To locate the desired scene quickly (skip scan)
Press ◀◀ during rewinding or ▶▶ during advancing the tape rapidly. ◀◀ or ▶▶ appears in the viewfinder.
To resume normal playback, press ▷.

About the playback sound
In the various playback modes, streaks appear. The sound can be heard during playback at double speed in forward direction, but may not be clear as normal speed playback.

If the still picture, frame-by-frame picture, or slow playback picture is noisy
Set the camcorder in slow playback mode, and press the + or – side of EDITSEARCH until the least noisy picture appears.

Note
Streaks appear in the still picture. They are wider when playing back an SP-recorded tape.

(U)



Using the Tape Counter

During recording or playback, the digits on the counter indicate the actual recording or playback time.

To Index the Whole Tape

Press COUNTER RESET at the beginning of the tape so that the counter shows "0:00:00". Write down the counter reading at a particular point so that you can easily find that point later by referring to the tape counter.

To Return to a Pre-registered Point

(U)

1 **During playback, press COUNTER RESET at the point you later want to locate. The counter shows "0:00:00".**

2 **Press □ when the playback has finished, as usual.**

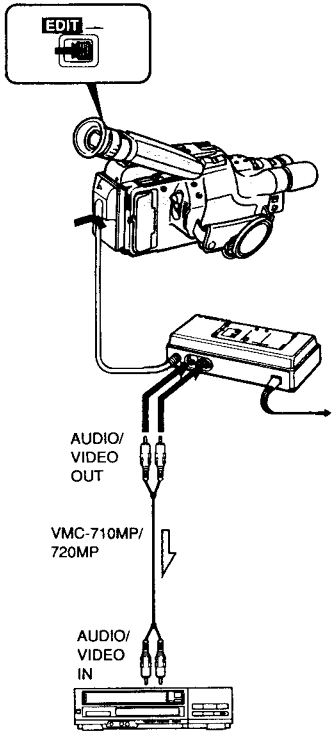
3 **Press ZERO MEM.**
The "ZERO MEM" indicator blinks in the viewfinder.

4 **Press ◀◀ or ▶▶.**
The tape rewinds or advances and stops automatically when the counter reaches approximately zero.

Notes on the tape counter and ZERO MEM button

- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide. There will be a time lag of several seconds especially when you repeat fast-forward running/rewinding and play back the tape recorded in LP and SP modes mixed.
- Be sure to press ZERO MEM after you stop the tape. It does not function during playback.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to the point where you pre-registered.

(V)



Editing onto Another VTR

You can create your own video programme by editing with any other 8 8-mm, β Betamax or VHS VHS format VTR. You can also superimpose and record the titles during editing.

Before You Begin

- Make connections using an appropriate audio/video connecting cable according to the connector type of your VTR. **(V)**
  Sony offers you the following cables (not supplied).
  [a] VMC-710MP/720MP: to phono and BNC-type
  If your VTR has stereo type audio inputs, use VMC-910MSP/920MSP.
  [b] VMC-2104: to 21-pin (EUROCONNECTOR)
  If your VTR has stereo type audio inputs, use VMC-2106.
- Set the input selector of the VTR to LINE, if available.

Operation

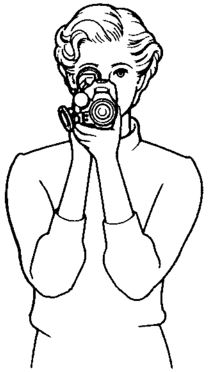
1 Insert a tape to be recorded into the recording VTR.
2 Set EDIT on the camcorder to the direction of the arrow (EDIT ON).
3 Set CHARGE/VTR on the AC power adaptor to VTR.
4 Set POWER of the camcorder to PLAYER and insert your recorded tape.
5 Play back on the camcorder and locate the point where you wish to start editing and set the camcorder to the playback pause mode.
6 On the recording VTR, locate the recording starting point and set the VTR to the recording pause mode.
7 Press ❚❚ of both VTRs simultaneously to start editing.

To stop editing momentarily, press ❚❚ on the recording VTR.
To edit more scenes, repeat steps 5 to 7.
To stop editing, press □ on both VTRs.

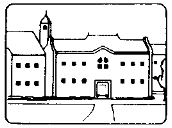
Use of the EDIT switch
When you set EDIT to the direction of the arrow (EDIT ON), picture and sound deteriorations resulting from editing can be kept to the minimum. Avoid using the edited tape for multiple generations of editing. After *editing, be sure to set this switch in the opposite* direction of the arrow (EDIT OFF).

If you use the DATA SCREEN function
You can record the indications displayed on the TV screen.

(W-1)



(W-2)



Hints for Better Shooting

Getting Stable Pictures

Take a good posture for shooting (W-1)
For hand-held shots, it is important to hold the camcorder properly.

- Hold the camcorder firmly and secure it with the grip belt so that you can easily manipulate the camcorder with your thumb.
- Place your right elbow firmly against your side.
- Place your left hand under the camcorder to support it. When adjusting the focus manually, make sure the camcorder does not move.
- Place your eye firmly against the viewfinder eyecup.

Use a tripod
If you have a tripod for a still camera, you can also use it with the camcorder. If a tripod is not available, try placing the camcorder on a tabletop or any other flat surface of suitable height.

Keep the horizontal plane level (W-2)
The horizontal plane can be easily determined by using the viewfinder frame as a reference.

Planning Ahead

If you are going to edit the tape after recording
Shoot the scene a little longer to make the editing easier.

If you are not going to edit the tape after recording
First record a title and then use the START/STOP button to make a smooth recording.

Lighting

Shoot with the sun behind you
When the light source is behind the subject, or in the following situations, the subject will be recorded too dark and the background too light.

- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background.
  In this case, the face will be recorded too dark.

Use video lights in the dark
To get the best colours, a sufficient light level must be maintained.
Photography lamps or halogen lamps are recommended. For best results, use of Sony video lights are recommended since their weight and low heat output levels allow safe, direct connection to the camcorder.
For detailed instructions on proper use of the light, read its instruction manual.

Brightness levels
Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording technique.

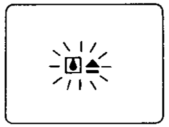
Situation	Brightness	Condition
Snow-covered mountains Snow fields Sandy beach, clear day in summer	Unit: lux	ND filter recom-mended
Clear day, mid day (100,000 lux)	100,000	Normal recording
Clear day, mid-afternoon (35,000)		
Overcast day, mid-day (32,000)		
	10,000	
Overcast day, one hour after sunrise (2,000)		
Office lit by fluorescent lamps, near window (1,000)		
Clear day, one hour before sunset (1,000)	1,000	
Department store counter (500 – 700)		
Station wicket (650)		
Office lit by fluorescent lamps (400 – 500)	500	
Room lit by two 30 W fluorescent lamps (300)	300	
Subway station platform (300)		
Arcade at night (150 – 200)		
	100	
Theater lobby (15 – 35)		Video light recom mended
Candlelight (10 – 15)	10	

Notes and Precautions

Notes on Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

(X-1)



If moisture condenses inside the unit (X-1)

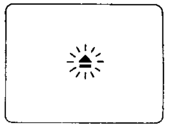
Moisture is present inside the camcorder when:
- The ▣ indication in the viewfinder blinks. When the tape is inserted, the ⏏ indication also blinks.
- Beeps sound continuously for about 5 seconds when the BEEP switch is set to ON.

In such cases, no function except for tape ejection will work.

Eject the tape, turn off the camcorder, and leave it with the cassette holder open for at least 1 hour.

The camcorder can be used again if the ▣ indication does not appear when the power is turned on again.

(X-2)



If moisture condenses on the surface of the tape (X-2)

Moisture is present on the surface of the tape when:
- The ⏏ indication blinks inside the viewfinder when the tape is inserted and a tape transport button (▷, ◀◀ etc.) is pressed.
- Beeps sound continuously for about 5 seconds when the BEEP switch is set to ON.

In such cases, no function except for tape ejection will work.

Eject the tape and let it sit for at least 1 hour.

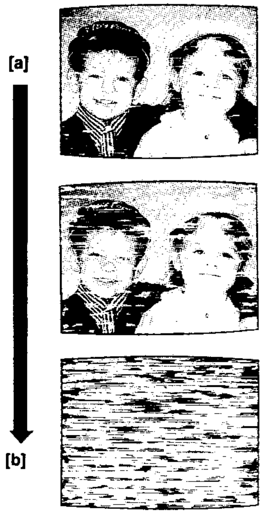
The tape can be used again if the ⏏ indication does not appear when the tape is inserted and a tape transport button is pressed.

If moisture condenses on the lens

No caution indications will appear, but the picture becomes dim.

Turn off the power and leave the camcorder unused for at least 1 hour.

(Y)



Notes on Video Head Cleaning

(Y)

To ensure clear picture, clean the video heads periodically.

When playback pictures are noisy or hardly visible, the video heads may be contaminated.
[a] Slight contamination
[b] Critical contamination

In such cases,
1. Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied), referring to its instructions.
2. After cleaning, check if the picture is clear by recording or playing back with an ordinary tape.
3. If the picture is still noisy, repeat cleaning. (Do not repeat cleaning more than 5 times.)

Caution
Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note
If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

Precautions

On operation

- Operate the camcorder on 6.0V (battery pack), 7.5V (AC power adaptor), or 9.0V (alkaline batteries).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Do not hold the camcorder by the viewfinder or the microphone.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the lens cap on the lens when not using the camera.
- Do not wrap up the camcorder and operate it because heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- Do not put the camcorder on the sand.

On care

- When the unit will not be used for a long time, periodically turn on the power, operate the camera section and player section and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth.
  Clean the camcorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Note on copyright
Television programmes, films, video tapes and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

Using your Camcorder Abroad

Each country has its own electricity system and TV colour system. Before using your camcorder abroad, check the following points.

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110V to 240V AC, 50/60 Hz.

Differences in colour systems

You can view the playback picture in the viewfinder. However, if you want to view the playback picture on a TV, it must be a PAL system based TV and should have video/audio inputs.

PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, Germany (Former West Germany), Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

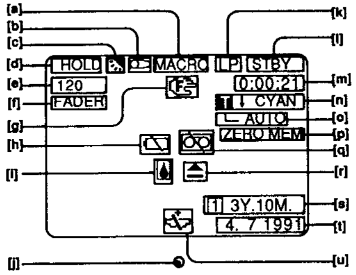
PAL M system country
Brazil

PAL N system countries
Argentina, Paraguay, Uruguay

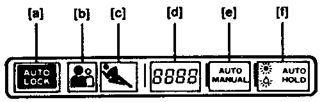
NTSC system countries
Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, The Philippines, U.S.A., etc.

SECAM system countries
Bulgaria, France, Hungary, Iran, Iraq, Monaco, Poland, The Soviet Union, etc.

(Z-1)



(Z-2)



Indications Inside the Viewfinder and the Display Window

Inside the Viewfinder

(Z-1)
[a] MACRO AF is pressed. (MACRO)
[b] WIND is selected.
[c] BACK LIGHT is pressed.
[d] White balance mode (☀, ☼, HOLD)
[e] PROGRAM AE setting, or Shutter speed
[f] FADER is pressed.
[g] Manual focusing
[h] "Exchange battery."
[i] Moisture has condensed.
[j] Shows up during recording.
When blinking: "Exchange battery or tape."
[k] Recording or playback mode (LP or SP)
[l] Tape transport mode
[m] Tape counter
[n] Title mode and colour
[o] Auto superimposing
[p] ZERO MEM is pressed.
[q] "Exchange tape or no tape inside."
[r] "Trouble has occurred" or "Clean video heads."
[s] Age
[t] Date or time
[u] "Replace lithium battery."

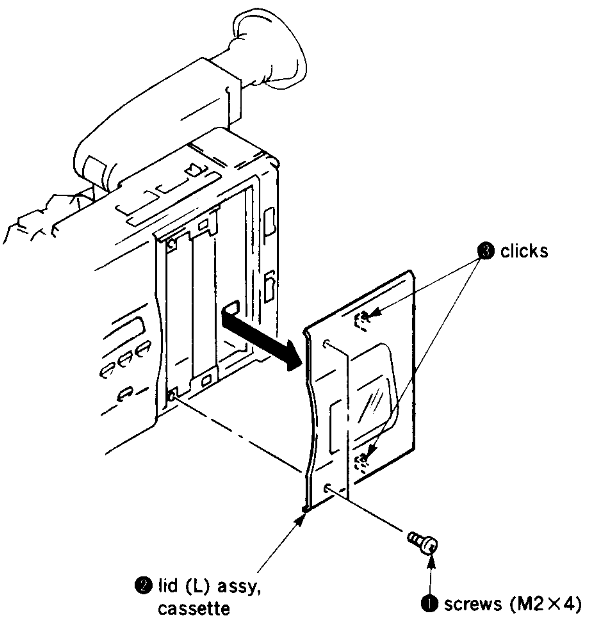
In the Display Window

(Z-2)
[a] Appears in automatic adjustment mode
[b] Appears in portrait mode
[c] Appears in sports mode
[d] Shutter speed
[e] Focus mode
[f] White balance mode

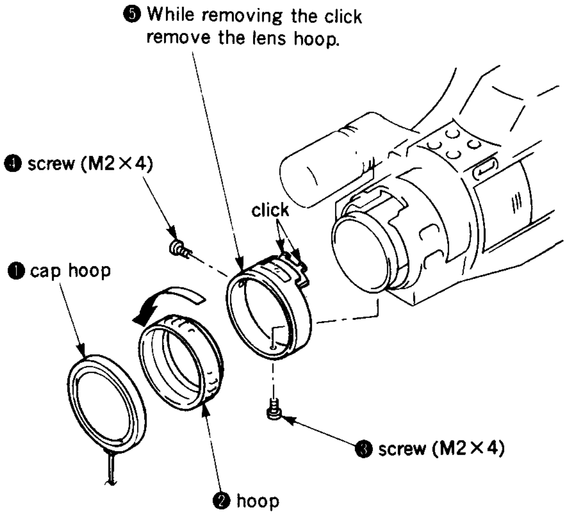
SECTION 2
DISASSEMBLY

2-1. REMOVAL OF CASSETTE LID ASSY

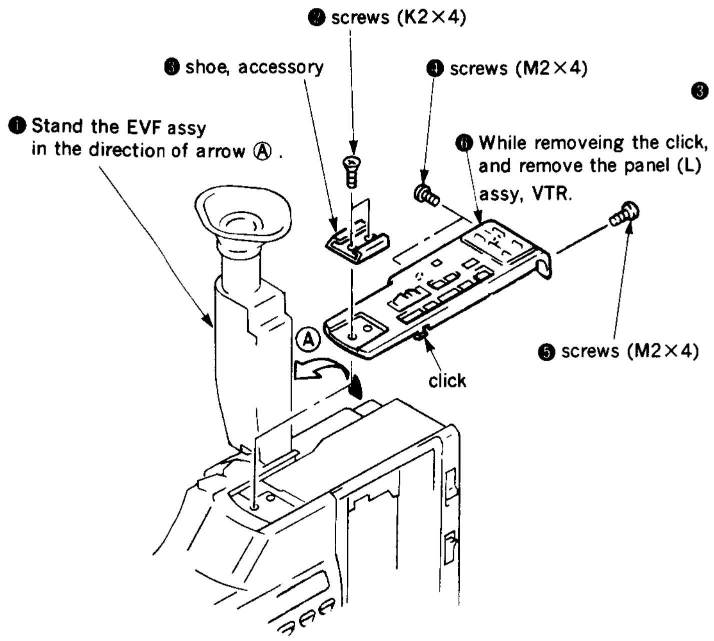
Note : When mounting, fit the click ❸ into holes completely, then clamp two screws ❶.


❸ clicks
❷ lid (L) assy, cassette
❶ screws (M2×4)

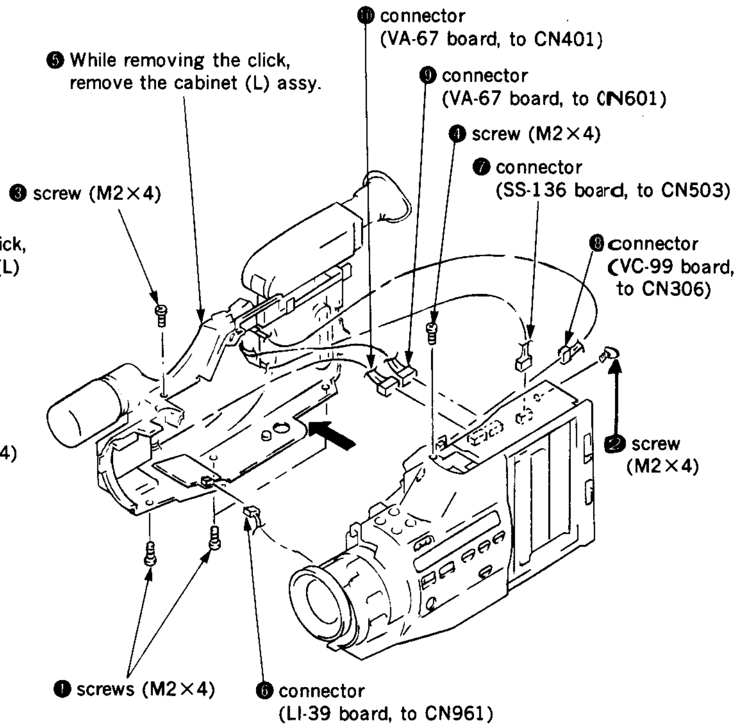
2-3. REMOVAL OF LENS HOOP


❺ While removing the click remove the lens hoop.
❹ screw (M2×4)
click
❶ cap hoop
❸ screw (M2×4)
❷ hoop

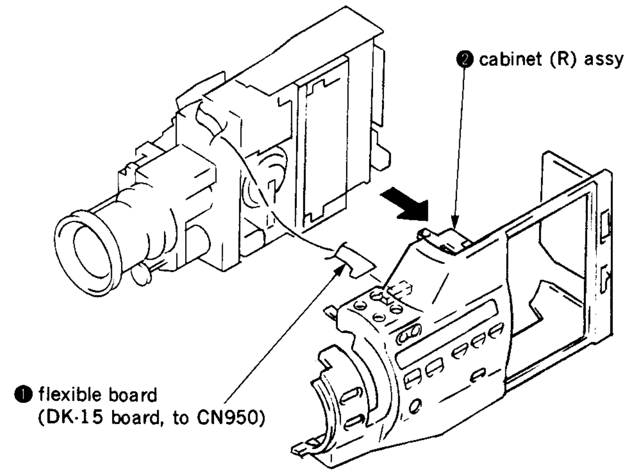
2-2. REMOVAL OF VTR PANEL (L) ASSY


❷ screws (K2×4)
❸ shoe, accessory
❹ screws (M2×4)
❶ Stand the EVF assy in the direction of arrow Ⓐ .
❻ While removeing the click, and remove the panel (L) assy, VTR.
❺ screws (M2×4)
click
Ⓐ

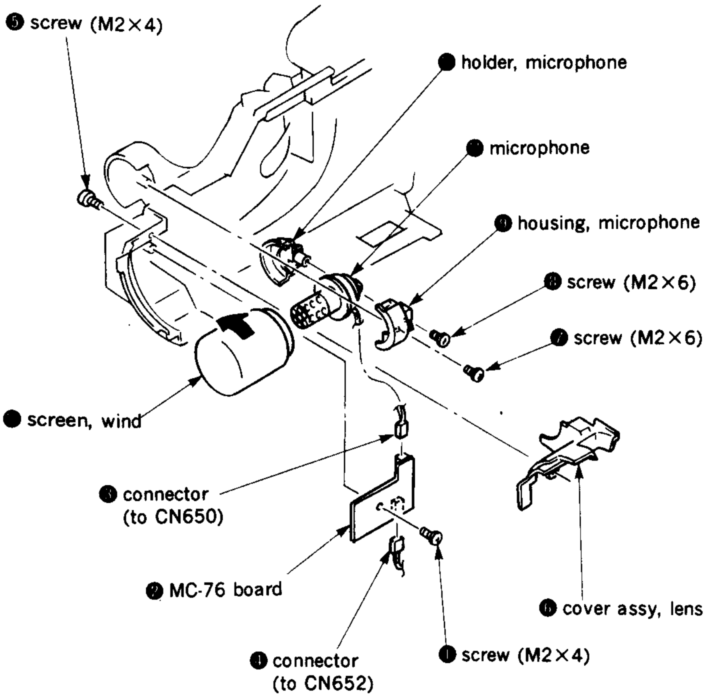
2-4. REMOVAL OF CABINET (L) ASSY


❿ connector (VA-67 board, to CN401)
❺ While removing the click, remove the cabinet (L) assy.
❾ connector (VA-67 board, to CN601)
❹ screw (M2×4)
❼ connector (SS-136 board, to CN503)
❸ screw (M2×4)
❽ connector (VC-99 board, to CN306)
❷ screw (M2×4)
❶ screws (M2×4)
❻ connector (LI-39 board, to CN961)

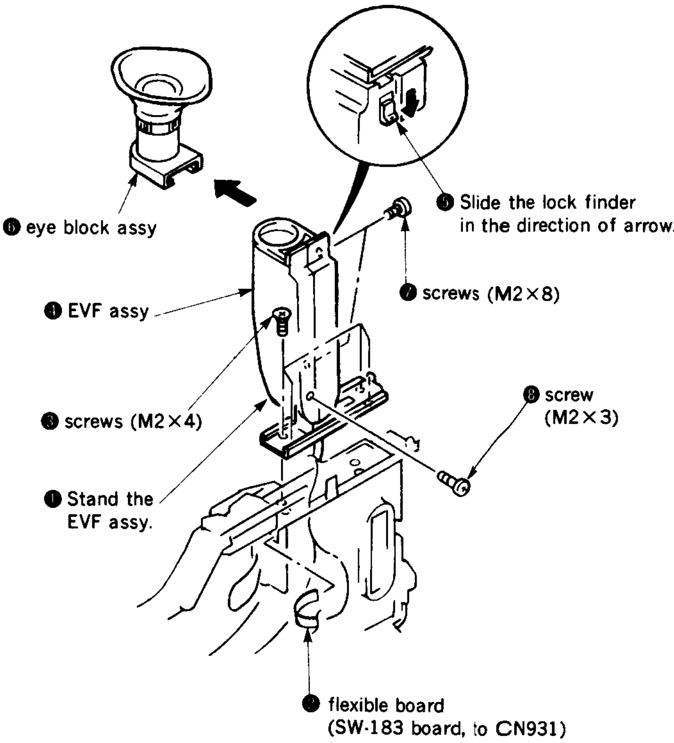
2-5. REMOVAL OF CABINET (R) ASSY

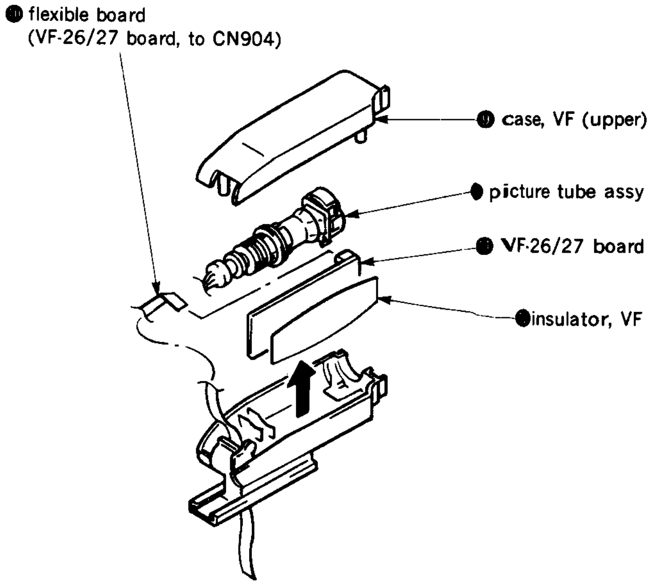

❷ cabinet (R) assy
❶ flexible board
(DK-15 board, to CN950)

2-6. REMOVAL OF MICROPHONE (MC-76 BOARD)

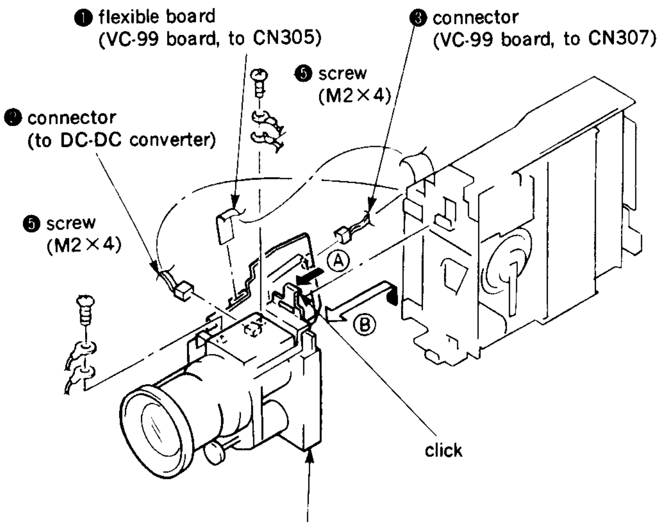

❺ screw (M2×4)
● holder, microphone
● microphone
❾ housing, microphone
❽ screw (M2×6)
❼ screw (M2×6)
● screen, wind
❸ connector
(to CN650)
❷ MC-76 board
❻ cover assy, lens
❹ connector
(to CN652)
❶ screw (M2×4)

2-7. REMOVAL OF EVF ASSY


❻ eye block assy
❺ Slide the lock finder
in the direction of arrow.
❼ screws (M2×8)
❹ EVF assy
❽ screw
(M2×3)
❸ screws (M2×4)
❶ Stand the
EVF assy.
❷ flexible board
(SW-183 board, to CN931)

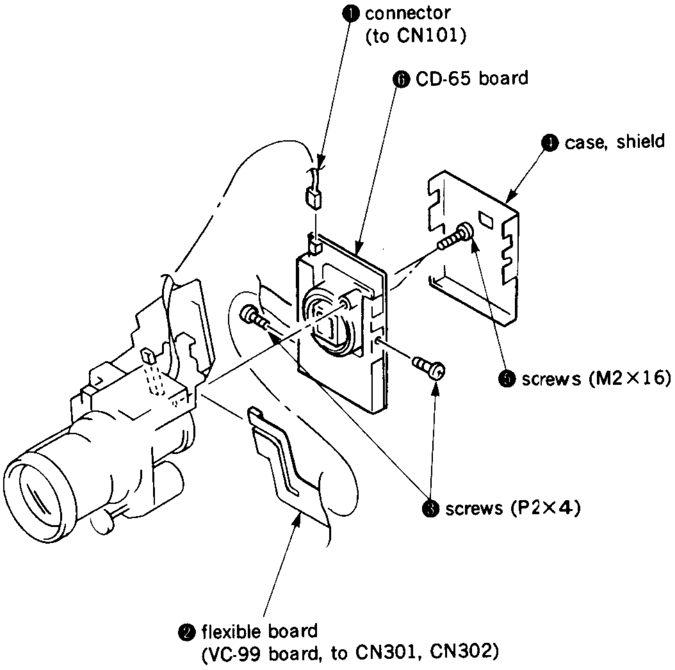

❿ flexible board
(VF-26/27 board, to CN904)
❾ case, VF (upper)
● picture tube assy
● VF-26/27 board
●insulator, VF

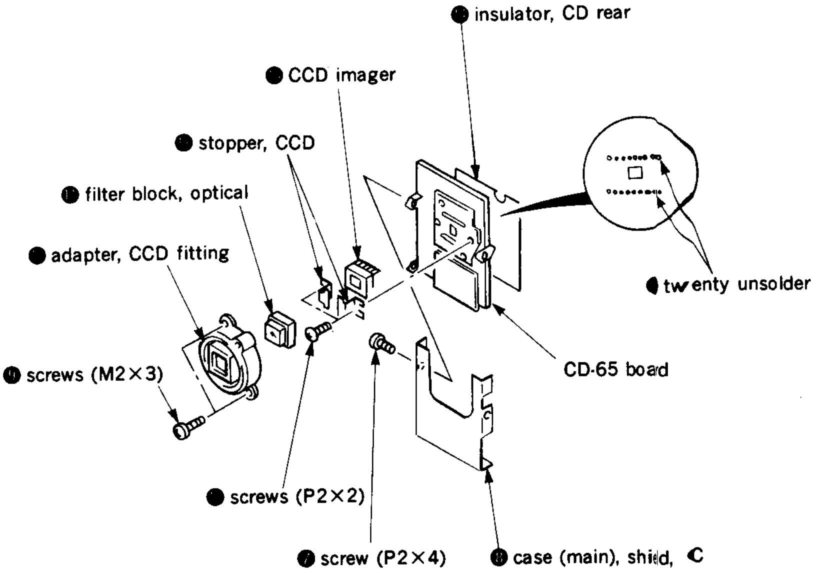
2-8. REMOVAL OF CAMERA BLOCK


❶ flexible board
(VC-99 board, to CN305)
❸ connector
(VC-99 board, to CN307)
❺ screw
(M2×4)
❷ connector
(to DC-DC converter)
❺ screw
(M2×4)
Ⓐ
Ⓑ
click

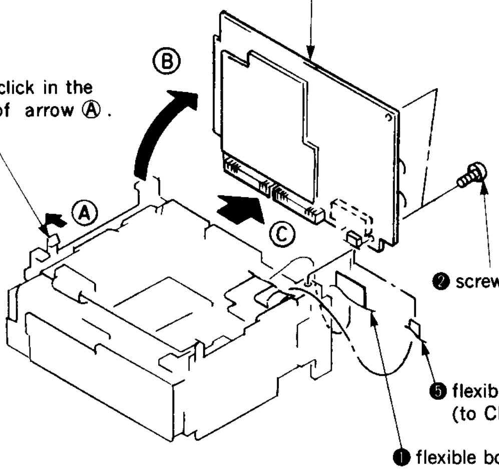
❹ While pushing the click to the direction of arrow Ⓐ, remove the camera block to the direction with arrow Ⓑ.

2-9. REMOVAL OF CCD IMAGER (CD-65 BOARD)


❶ connector
(to CN101)
❻ CD-65 board
❹ case, shield
❺ screws (M2×16)
❸ screws (P2×4)
❷ flexible board
(VC-99 board, to CN301, CN302)


● insulator, CD rear
● CCD imager
● stopper, CCD
● filter block, optical
● adapter, CCD fitting
● screws (M2×3)
● twenty unsolder
CD-65 board
● screws (P2×2)
❼ screw (P2×4)
❽ case (main), shield, C

2-10. REMOVAL OF VA-67 BOARD



❶ flexible board (to CN508)

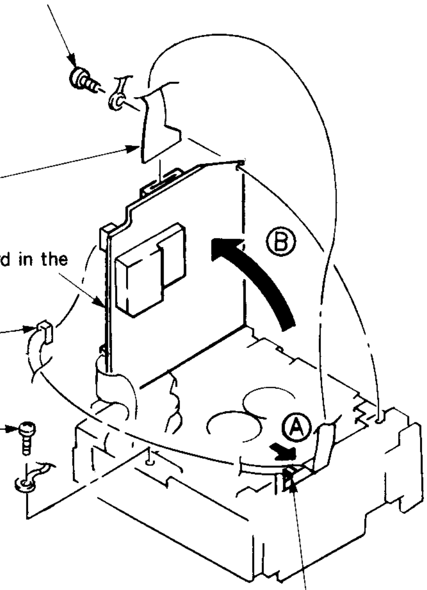
❷ screws (M2×4)

❸ Push the click in the direction of arrow Ⓐ.

❹ Open the VA-67 board in the direction of arrow Ⓑ, and remove in the direction of arrow Ⓐ.

❺ flexible board (to CN901)

2-11. REMOVAL OF SS-136 BOARD



❶ flexible board (to CN509)

❷ screw (M2×4)

❸ screw (M2×4)

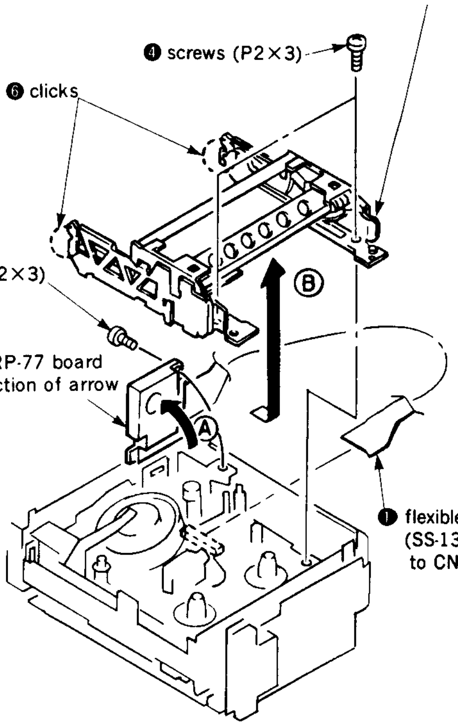
❹ connector (to CN505)

❺ Push the click in the direction of arrow Ⓐ.

❻ Open the SS-136 board in the direction of arrow Ⓐ.

2-12. REMOVAL OF CASSETTE COMPARTMENT ASSEMBLY

Note : When mounting, fit the clicks ❻ into completely, then clamp two screws ❹.



❶ flexible board (SS-136 board, to CN501)

❷ screw (P2×3)

❸ Open the RP-77 board in the direction of arrow Ⓐ.

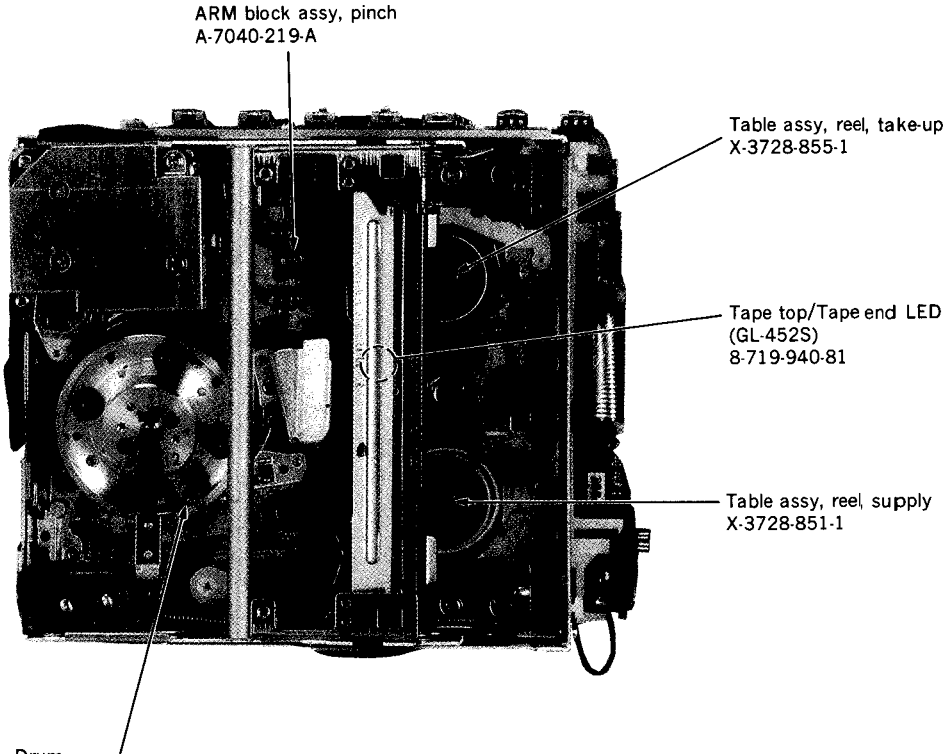
❹ screws (P2×3)

❺ Remove the cassette compartment assy in the direction of arrow Ⓑ.

❻ clicks

2-13. INTERNAL VIEWS

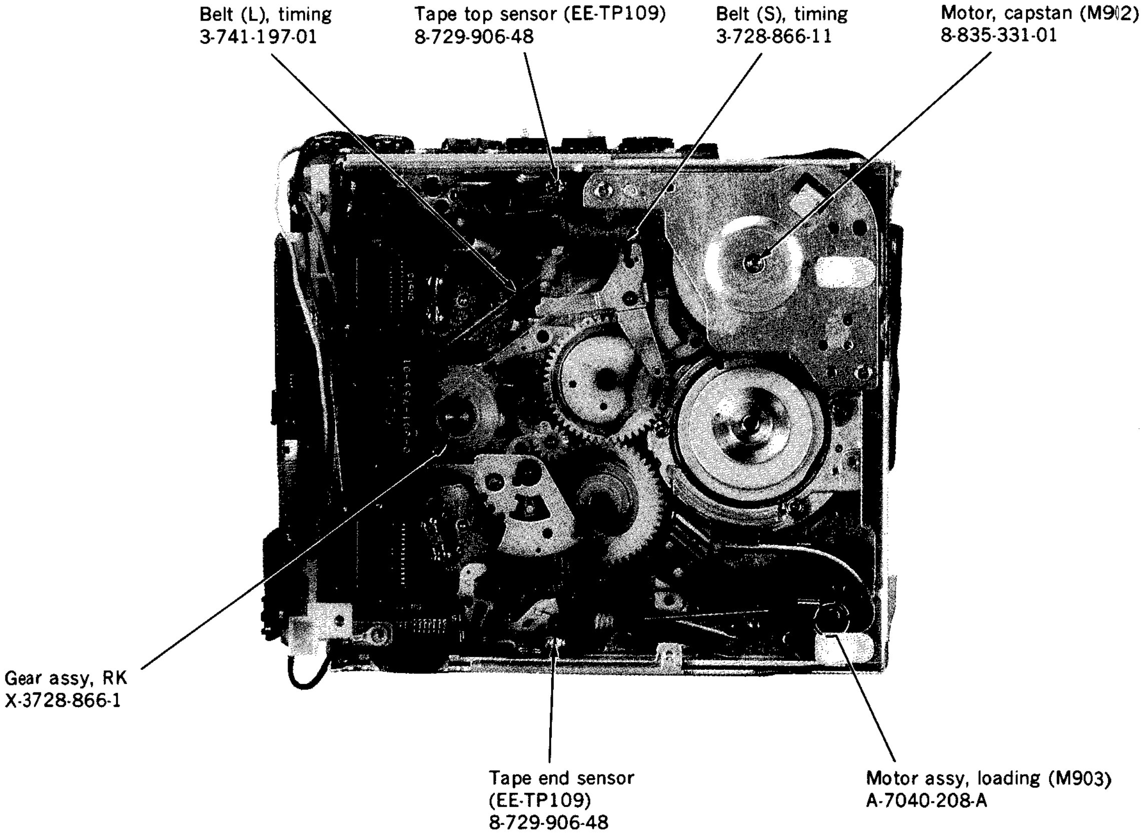
— Upper —


ARM block assy, pinch
A-7040-219-A
Table assy, reel, take-up
X-3728-855-1
Tape top/Tape end LED
(GL-452S)
8-719-940-81
Table assy, reel, supply
X-3728-851-1

Drum

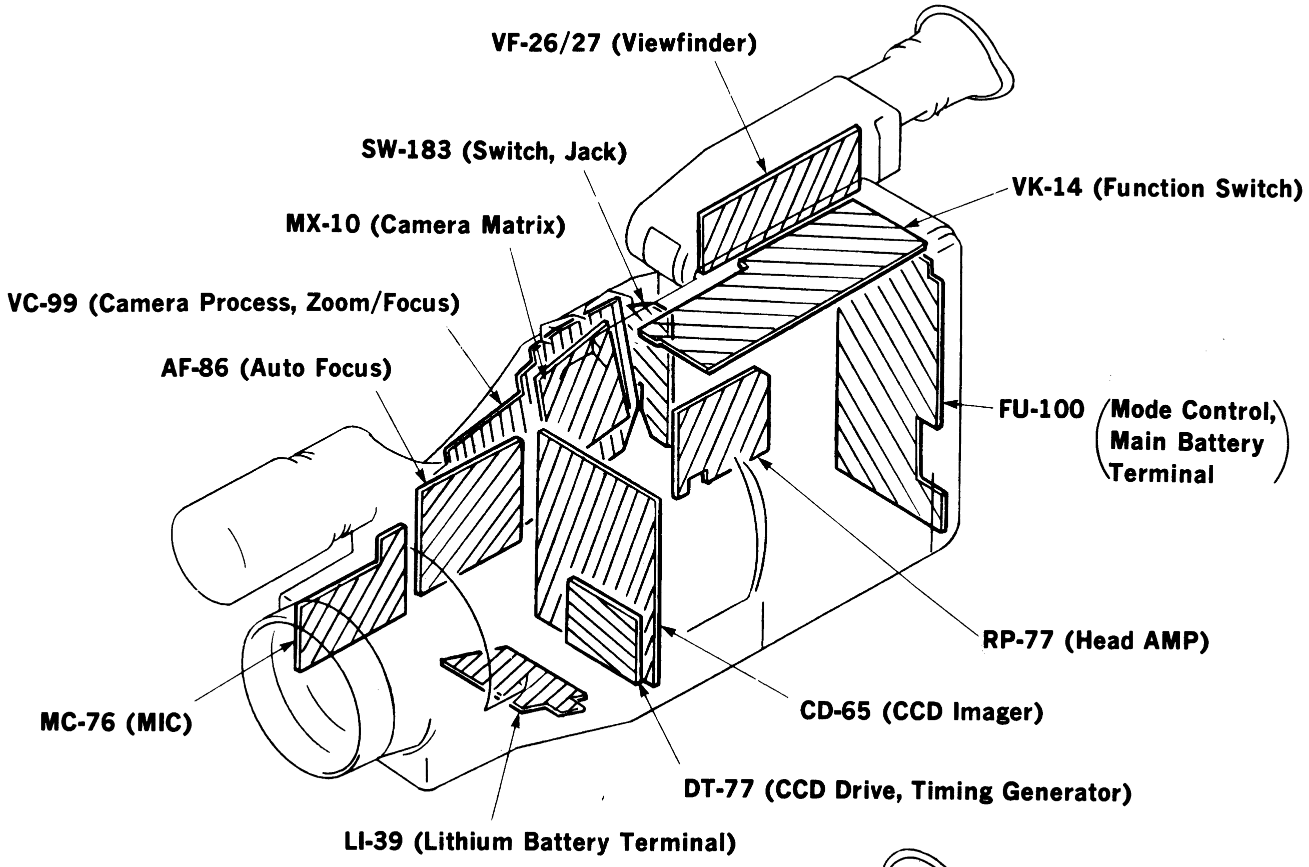
Drum ASSY (DGU-64A-R)	A-7048-405-A
Drum upper (DGR-64-R)	A-7049-343-A

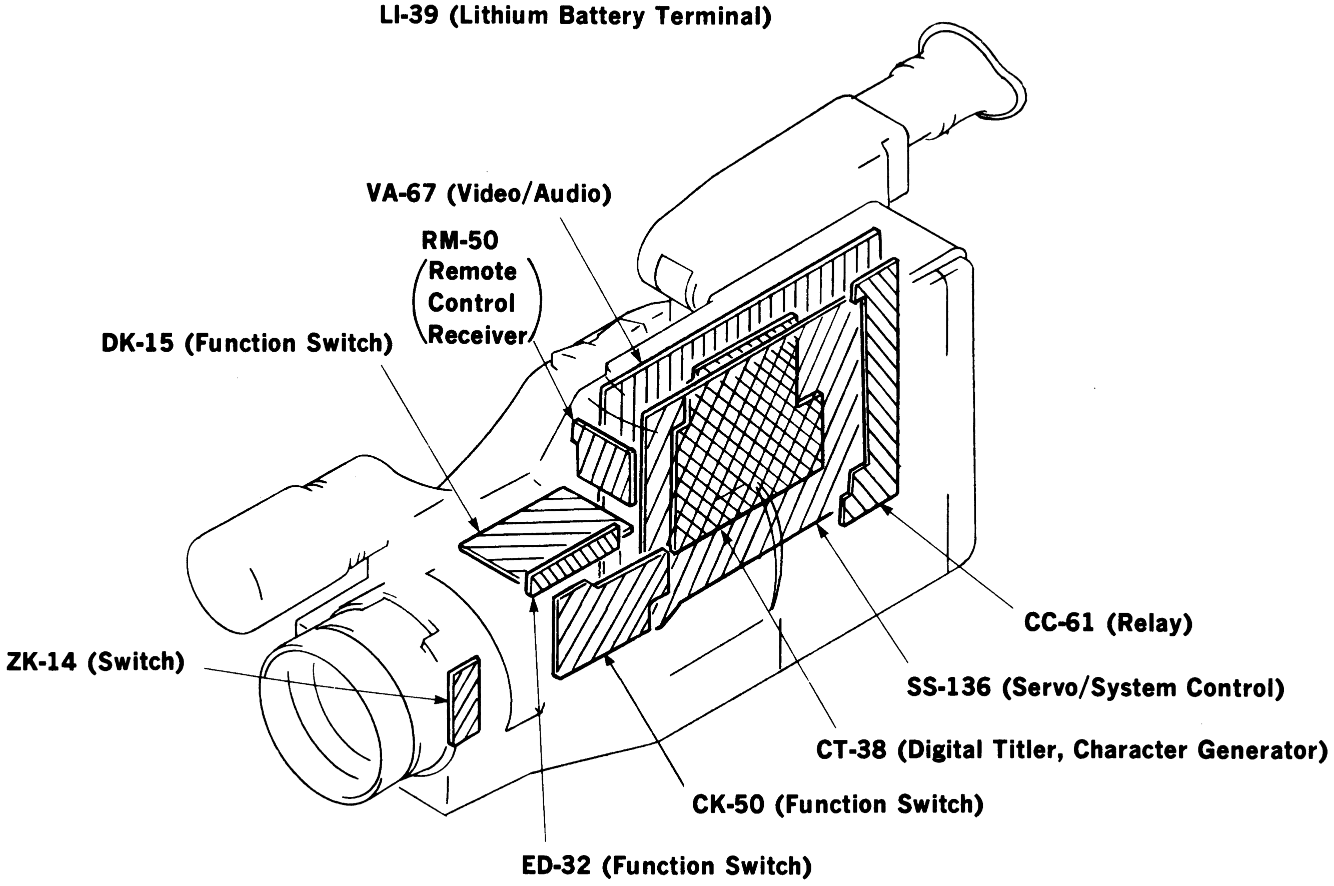
— Lower —


Belt (L), timing
3-741-197-01
Tape top sensor (EE-TP109)
8-729-906-48
Belt (S), timing
3-728-866-11
Motor, capstan (M902)
8-835-331-01
Gear assy, RK
X-3728-866-1
Tape end sensor
(EE-TP109)
8-729-906-48
Motor assy, loading (M903)
A-7040-208-A

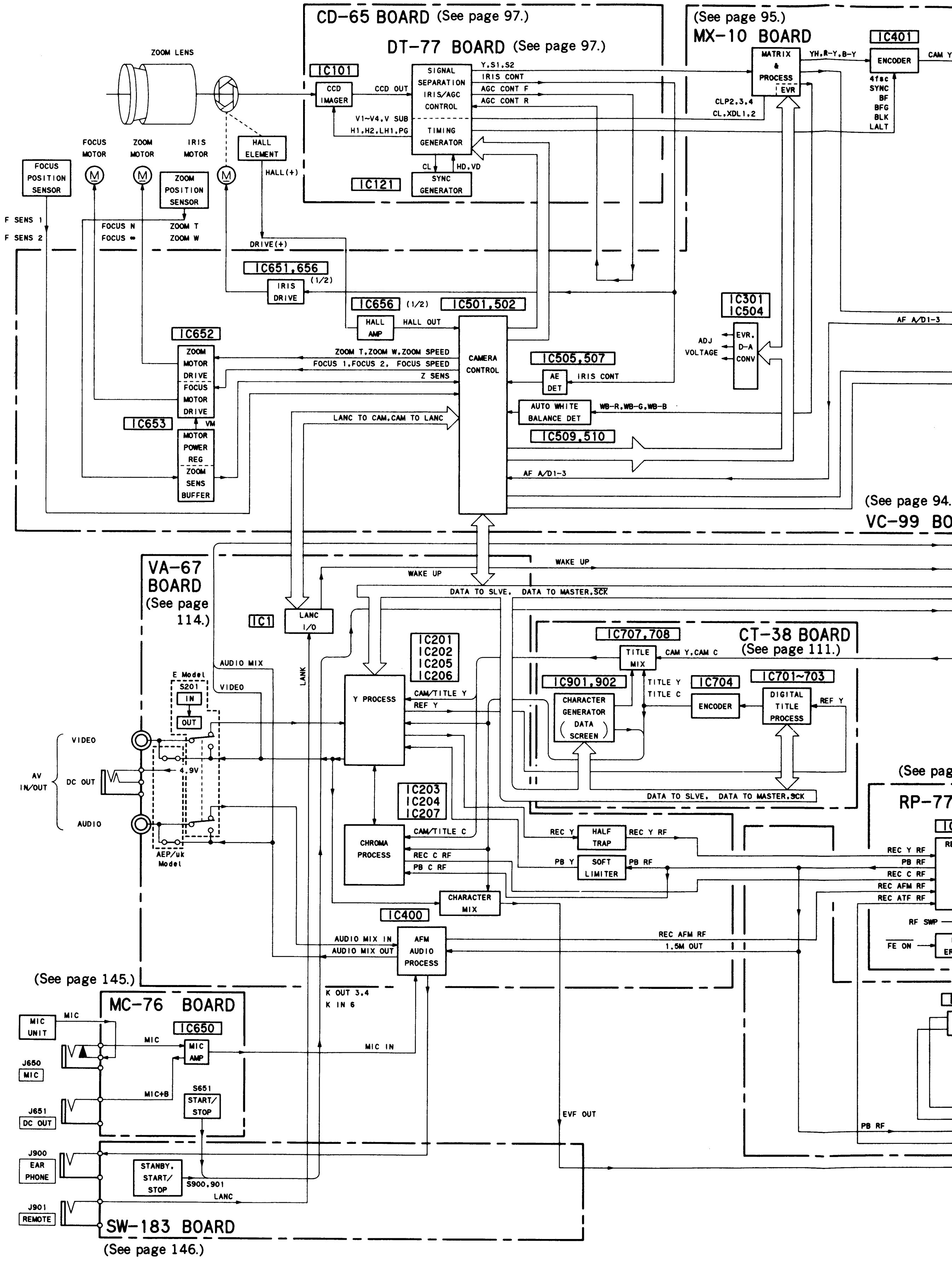
SECTION 3
DIAGRAMS

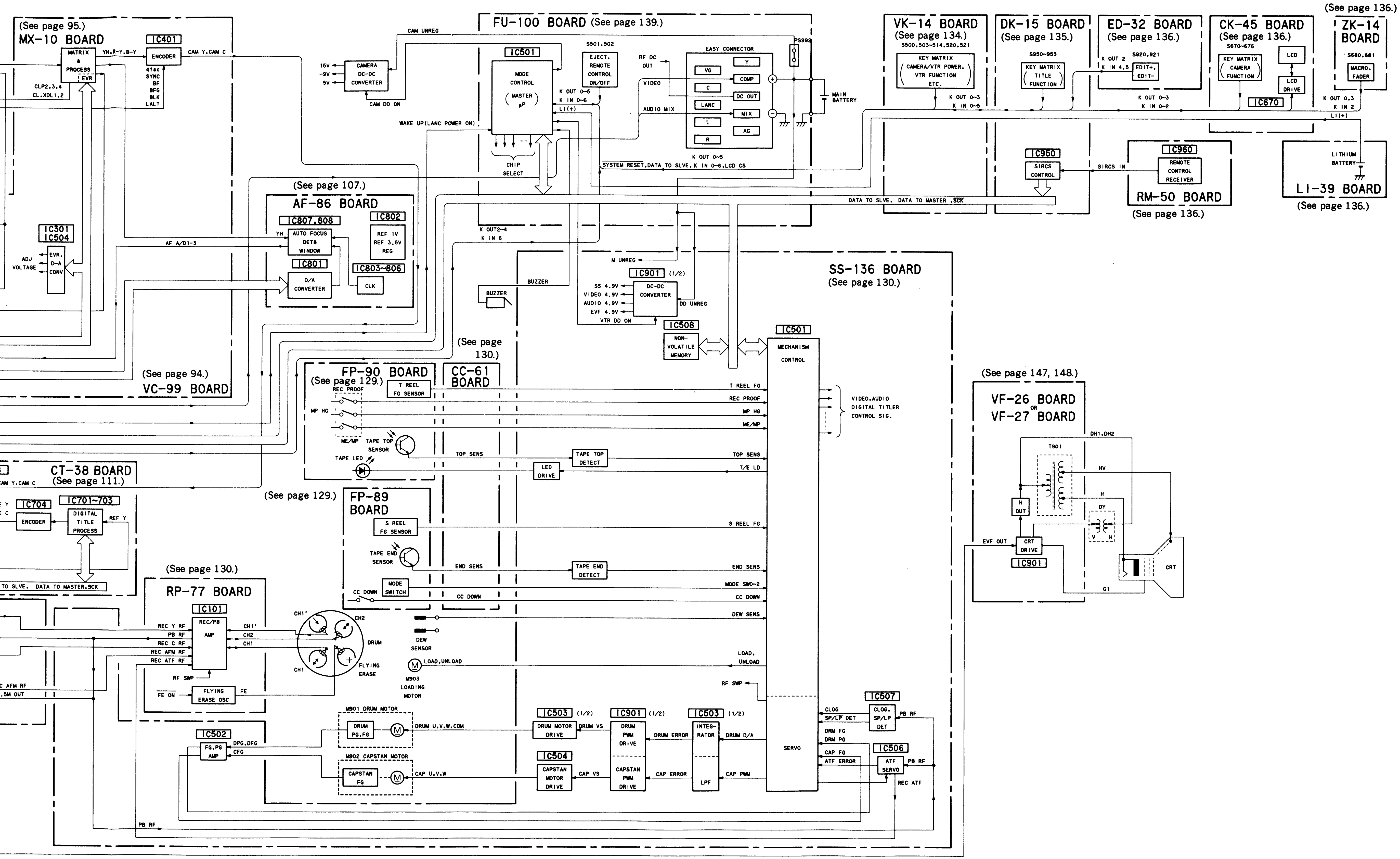
3-1. CIRCUIT BOARDS LOCATION


VF-26/27 (Viewfinder)
SW-183 (Switch, Jack)
VK-14 (Function Switch)
MX-10 (Camera Matrix)
VC-99 (Camera Process, Zoom/Focus)
AF-86 (Auto Focus)
FU-100 (Mode Control, Main Battery Terminal)
RP-77 (Head AMP)
MC-76 (MIC)
CD-65 (CCD Imager)
DT-77 (CCD Drive, Timing Generator)
LI-39 (Lithium Battery Terminal)

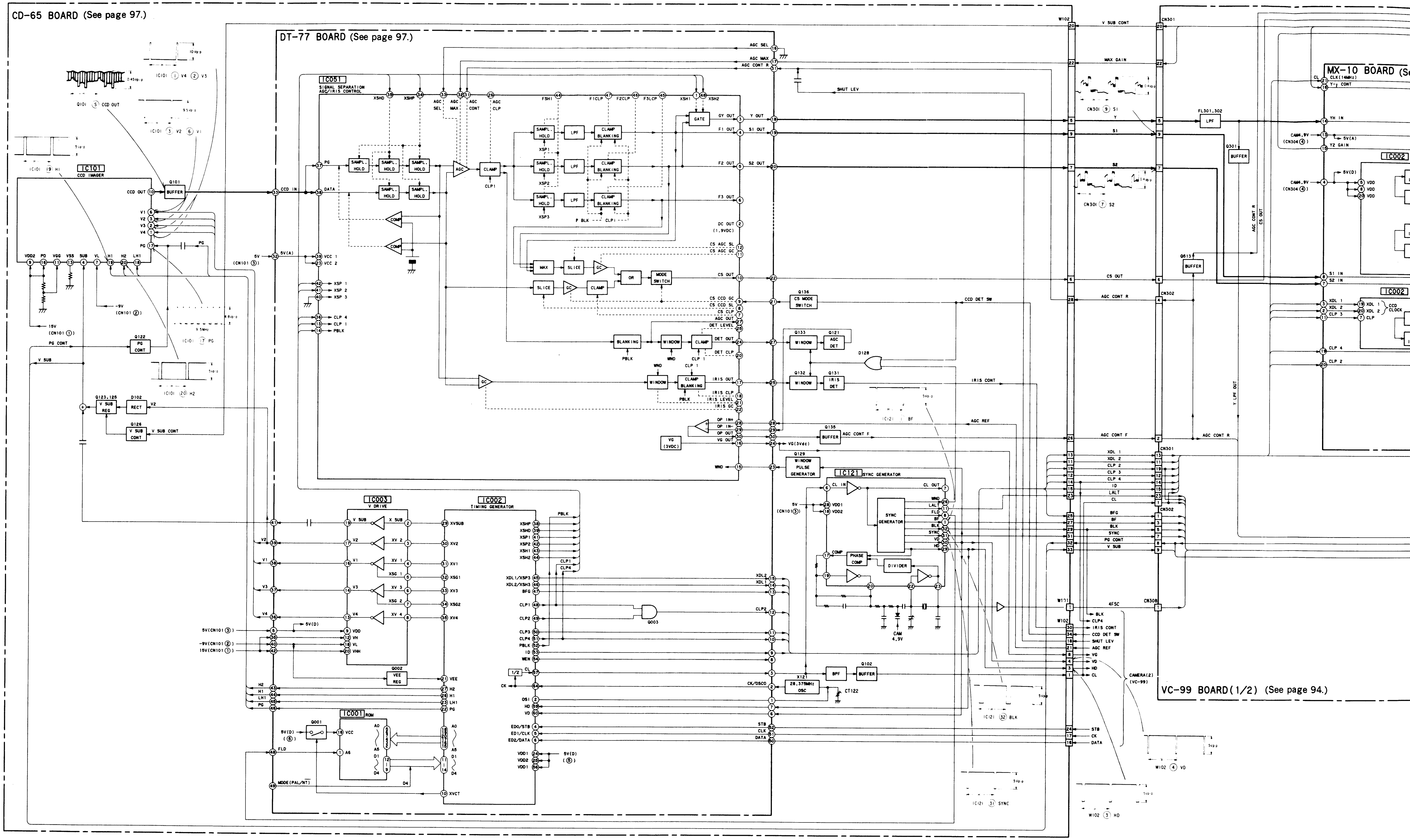

VA-67 (Video/Audio)
RM-50 (Remote Control Receiver)
DK-15 (Function Switch)
CC-61 (Relay)
SS-136 (Servo/System Control)
ZK-14 (Switch)
CT-38 (Digital Titler, Character Generator)
CK-50 (Function Switch)
ED-32 (Function Switch)

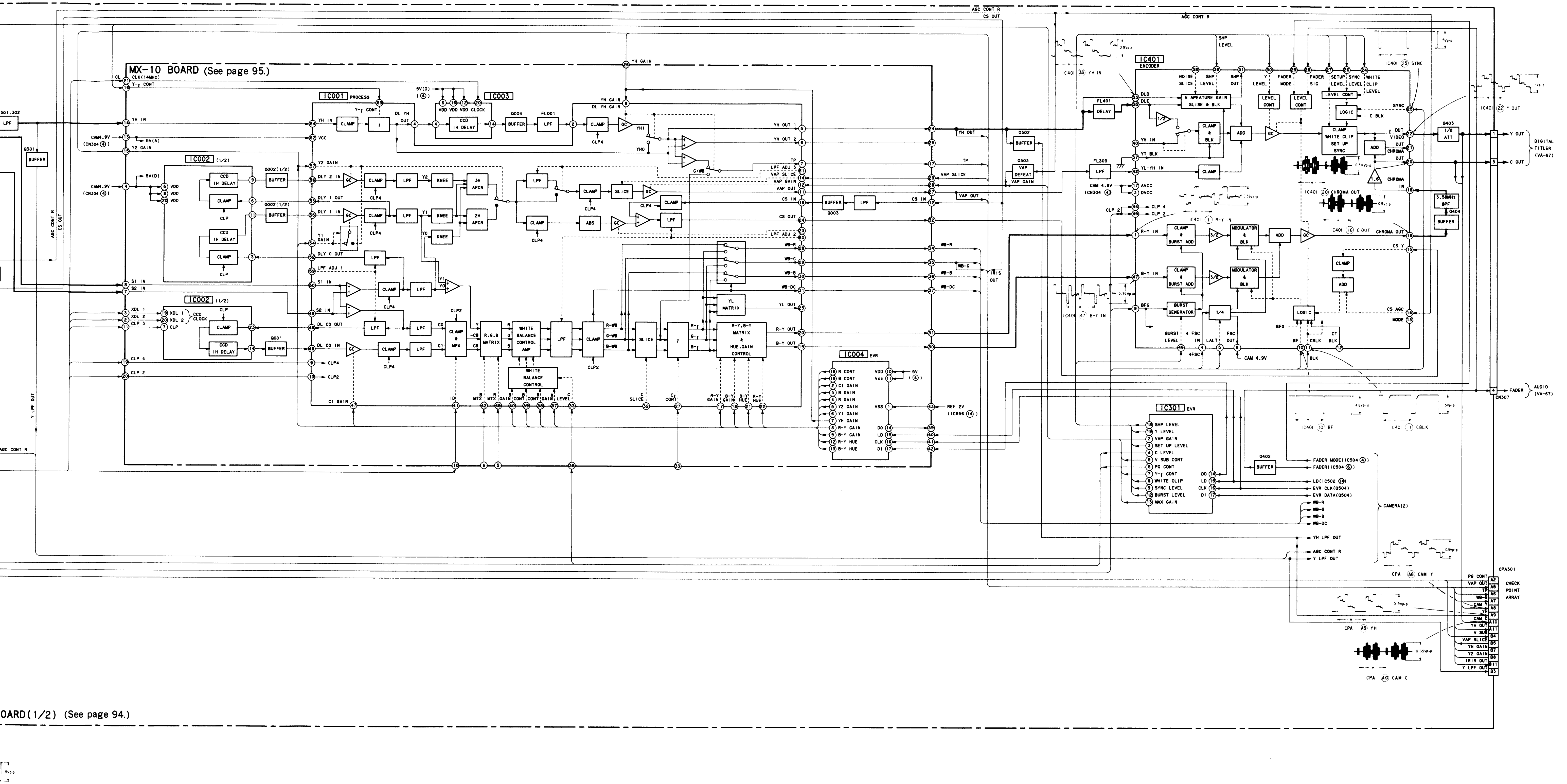
3-2. OVERALL BLOCK DIAGRAM


CD-65 BOARD (See page 97.)
DT-77 BOARD (See page 97.)
(See page 95.)
MX-10 BOARD
ZOOM LENS
IC101
CCD IMAGER
CCD OUT
SIGNAL SEPARATION IRIS/AGC CONTROL
Y,S1,S2
IRIS CONT
AGC CONT F
AGC CONT R
V1~V4,V SUB
H1,H2,LH1,PG
TIMING GENERATOR
IC121
CL
HD,VD
SYNC GENERATOR
MATRIX & PROCESS
EVR
YH,R-Y,B-Y
IC401
ENCODER
CAM Y
CLP2,3,4
CL,XDL1,2
4fsc
SYNC
BF
BFG
BLK
LALT
HALL ELEMENT
HALL(+)
FOCUS MOTOR
ZOOM MOTOR
IRIS MOTOR
FOCUS POSITION SENSOR
ZOOM POSITION SENSOR
F SENS 1
F SENS 2
FOCUS N
FOCUS =
ZOOM T
ZOOM W
DRIVE(+)
IC651,656 (1/2)
IRIS DRIVE
IC656 (1/2)
HALL AMP
HALL OUT
IC501,502
IC652
ZOOM MOTOR DRIVE
FOCUS MOTOR DRIVE
IC653
MOTOR POWER REG
ZOOM SENS BUFFER
VM
ZOOM T,ZOOM W,ZOOM SPEED
FOCUS 1,FOCUS 2, FOCUS SPEED
Z SENS
LANC TO CAM,CAM TO LANC
CAMERA CONTROL
IC505,507
AE DET
IRIS CONT
AUTO WHITE BALANCE DET
WB-R,WB-G,WB-B
IC509,510
AF A/D1-3
IC301
IC504
ADJ VOLTAGE
EVR, D-A CONV
(See page 94.)
VC-99 BO
VA-67 BOARD (See page 114.)
WAKE UP
DATA TO SLVE. DATA TO MASTER,SCK
IC1
LANC I/O
LANK
AUDIO MIX
VIDEO
E Model
S201
IN
OUT
4.9V
AEP/uk Model
VIDEO
DC OUT
AUDIO
AV IN/OUT
IC201
IC202
IC205
IC206
Y PROCESS
CAM/TITLE Y
REF Y
IC203
IC204
IC207
CAM/TITLE C
CHROMA PROCESS
REC C RF
PB C RF
CHARACTER MIX
IC400
AUDIO MIX IN
AUDIO MIX OUT
AFM AUDIO PROCESS
CT-38 BOARD (See page 111.)
IC707,708
TITLE MIX
CAM Y,CAM C
IC901,902
CHARACTER GENERATOR (DATA SCREEN)
TITLE Y
TITLE C
IC704
ENCODER
IC701~703
DIGITAL TITLE PROCESS
REF Y
DATA TO SLVE. DATA TO MASTER,SCK
REC Y
HALF TRAP
REC Y RF
PB Y
SOFT LIMITER
PB RF
REC AFM RF
1.5M OUT
(See pag
RP-77
REC Y RF
PB RF
REC C RF
REC AFM RF
REC ATF RF
RF SWP
FE ON
PB RF
(See page 145.)
MC-76 BOARD
MIC UNIT
MIC
IC650
MIC AMP
J650 MIC
MIC+B
J651 DC OUT
S651 START/STOP
K OUT 3,4
K IN 6
MIC IN
EVF OUT
J900 EAR PHONE
J901 REMOTE
STANBY, START/STOP
S900,901
LANC
SW-183 BOARD
(See page 146.)


(See page 95.)
MX-10 BOARD
MATRIX & PROCESS EVR
IC401
ENCODER
CAM Y.CAM C
CAM UNREG
CAMERA DC-DC CONVERTER
CAM DD ON
FU-100 BOARD (See page 139.)
IC501
MODE CONTROL (MASTER µP)
CHIP SELECT
WAKE UP(LANC POWER ON)
S501,502
EJECT, REMOTE CONTROL ON/OFF
EASY CONNECTOR
MAIN BATTERY
SYSTEM RESET,DATA TO SLVE,K IN 0-6,LCD CS
VK-14 BOARD (See page 134.)
KEY MATRIX (CAMERA/VTR POWER, VTR FUNCTION ETC.)
DK-15 BOARD (See page 135.)
KEY MATRIX TITLE FUNCTION
ED-32 BOARD (See page 136.)
EDIT+, EDIT-
CK-45 BOARD (See page 136.)
KEY MATRIX CAMERA FUNCTION
LCD
LCD DRIVE
IC670
(See page 136.)
ZK-14 BOARD
MACRO, FADER
IC950
SIRCS CONTROL
IC960
REMOTE CONTROL RECEIVER
RM-50 BOARD (See page 136.)
LITHIUM BATTERY
LI-39 BOARD (See page 136.)
DATA TO SLVE, DATA TO MASTER ,SCK
(See page 107.)
AF-86 BOARD
IC807,808
AUTO FOCUS DET& WINDOW
IC802
REF 1V REF 3.5V REG
IC801
D/A CONVERTER
IC803-806
CLK
AF A/D1-3
IC301 IC504
EVR, D-A CONV
ADJ VOLTAGE
SS-136 BOARD (See page 130.)
BUZZER
IC901 (1/2)
DC-DC CONVERTER
IC508
NON-VOLATILE MEMORY
IC501
MECHANISM CONTROL
VIDEO,AUDIO DIGITAL TITLER CONTROL SIG.
(See page 94.)
VC-99 BOARD
FP-90 BOARD (See page 129.)
T REEL FG SENSOR
CC-61 BOARD
(See page 130.)
TAPE TOP SENSOR
TAPE TOP DETECT
LED DRIVE
CT-38 BOARD (See page 111.)
IC704
ENCODER
IC701-703
DIGITAL TITLE PROCESS
(See page 129.)
FP-89 BOARD
S REEL FG SENSOR
TAPE END SENSOR
TAPE END DETECT
MODE SWITCH
(See page 130.)
RP-77 BOARD
IC101
REC/PB AMP
FLYING ERASE OSC
DRUM
FLYING ERASE
DEW SENSOR
M903 LOADING MOTOR
IC502
FG,PG AMP
M901 DRUM MOTOR
DRUM PG,FG
M902 CAPSTAN MOTOR
CAPSTAN FG
IC503 (1/2)
DRUM MOTOR DRIVE
IC504
CAPSTAN MOTOR DRIVE
IC901 (1/2)
DRUM PWM DRIVE
CAPSTAN PWM DRIVE
IC503 (1/2)
INTEGRATOR
LPF
SERVO
IC507
CLOG, SP/LP DET
IC506
ATF SERVO
(See page 147, 148.)
VF-26 BOARD OR VF-27 BOARD
T901
H OUT
CRT DRIVE
IC901
DY
CRT

3-3. CAMERA (1) BLOCK DIAGRAM


CD-65 BOARD (See page 97.)
DT-77 BOARD (See page 97.)
MX-10 BOARD
VC-99 BOARD(1/2) (See page 94.)
IC101 CCD IMAGER
Q101 BUFFER
Q122 PG CONT
Q123,125 V SUB REG
D102 RECT
Q126 V SUB CONT
IC051 SIGNAL SEPARATION AGC/IRIS CONTROL
SAMPL. HOLD
AGC
CLAMP
LPF
CLAMP BLANKING
GATE
COMP
MAX
SLICE
GC
OR
MODE SWITCH
BLANKING
WINDOW
Y OUT
S1 OUT
S2 OUT
CS OUT
IRIS CONT
IC003 V DRIVE
IC002 TIMING GENERATOR
IC001 ROM
Q001
Q002 VEE REG
Q003
Q136 CS MODE SWITCH
Q133 WINDOW
Q121 AGC DET
Q132 WINDOW
Q131 IRIS DET
Q135 BUFFER
Q129 WINDOW PULSE GENERATOR
IC121 SYNC GENERATOR
PHASE COMP
DIVIDER
X121 28.375MHz OSC
BPF
Q102 BUFFER
VG (3VDC)
W102
CN301
CN302
CN308
FL301,302 LPF
Q301 BUFFER
Q613 BUFFER
IC002
CAMERA(2) (VC-99)
SHUT LEV
MAX GAIN
V SUB CONT
AGC CONT R
CCD DET SW
AGC REF
AGC CONT F
XDL 1
XDL 2
CLP 2
CLP 3
CLP 4
ID
LALT
CL
BFG
BF
BLK
SYNC
PG CONT
V SUB
4FSC
STB
CK
DATA
IC101 ⑲ H1
IC101 ⑤ CCD OUT
IC101 ⑦ PG
IC101 ⑳ H2
IC121 ㉜ BLK
IC121 ㉛ SYNC
W102 ④ VD
W102 ⑤ HD
CN301 ⑨ S1
CN301 ⑦ S2


MX-10 BOARD (See page 95.)
IC001 PROCESS
IC002 (1/2)
IC003
IC004 EVR
IC301 EVR
IC401 ENCODER
CLAMP
LPF
KNEE
3H APCN
2H APCN
SLICE
ABS
BUFFER
CCD 1H DELAY
R.G.B MATRIX
WHITE BALANCE CONTROL AMP
WHITE BALANCE CONTROL
R-Y, B-Y MATRIX & HUE, GAIN CONTROL
YL MATRIX
CLAMP & MPX
FL001
FL303
FL401
DELAY
H APEATURE GAIN SLISE & BLK
MODULATOR & BLK
CLAMP & BURST ADD
BURST GENERATOR
CLAMP WHITE CLIP SET UP SYNC
LEVEL CONT
LOGIC
1/2 ATT
3.58MHz BPF
VAP DEFEAT
Q301
Q302
Q303
Q402
Q403
Q404
Q001
Q002(1/2)
Q003
Q004
YH IN
YH OUT 1
YH OUT 2
VAP SLICE
VAP GAIN
VAP OUT
CS IN
CS OUT
WB-R
WB-G
WB-B
WB-DC
YL OUT
R-Y OUT
B-Y OUT
REF 2V (IC656 (14))
AGC CONT R
IRIS OUT
Y OUT
C OUT
DIGITAL TITLER (VA-67)
AUDIO (VA-67)
FADER
CN307
FADER MODE(IC504 (4))
FADER(IC504 (6))
LD(IC502 (4))
EVR CLK(Q504)
EVR DATA(Q504)
CAMERA(2)
YH LPF OUT
Y LPF OUT
CPA301
CHECK POINT ARRAY
PG CONT
VAP OUT
CAM Y
CAM C
YH OUT
V SUB
VAP SLICE
YH GAIN
Y2 GAIN
IRIS OUT
Y LPF OUT
CPA (A8) CAM Y
CPA (A9) YH
CPA (A10) CAM C
IC401 (33) YH IN
IC401 (25) SYNC
IC401 (22) Y OUT
IC401 (20) CHROMA OUT
IC401 (1) R-Y IN
IC401 (16) C OUT
IC401 (47) B-Y IN
IC401 (10) BF
IC401 (11) CBLK
CAM4.9V (CN304 (4))
5V(D)
CLK(14MHz)
ARD(1/2) (See page 94.)

3-4. CAMERA SYSTEM CONTROL VC-99 BOARD IC501 (MC68HC11E9)

〔Description〕

MC68HC11E9 is a 8-bit one-chip micro controller with a built-in nonvolatile memory (EEPROM). All the camera system, which has been composed by mere than one, can be controlled by only this micro controller. In addition, protocol master control of the LANC communication can be performed.

1. Function

1) EVR Control
2) AWB Control
3) AE Control
4) AF Control
5) LANC communication protocol control

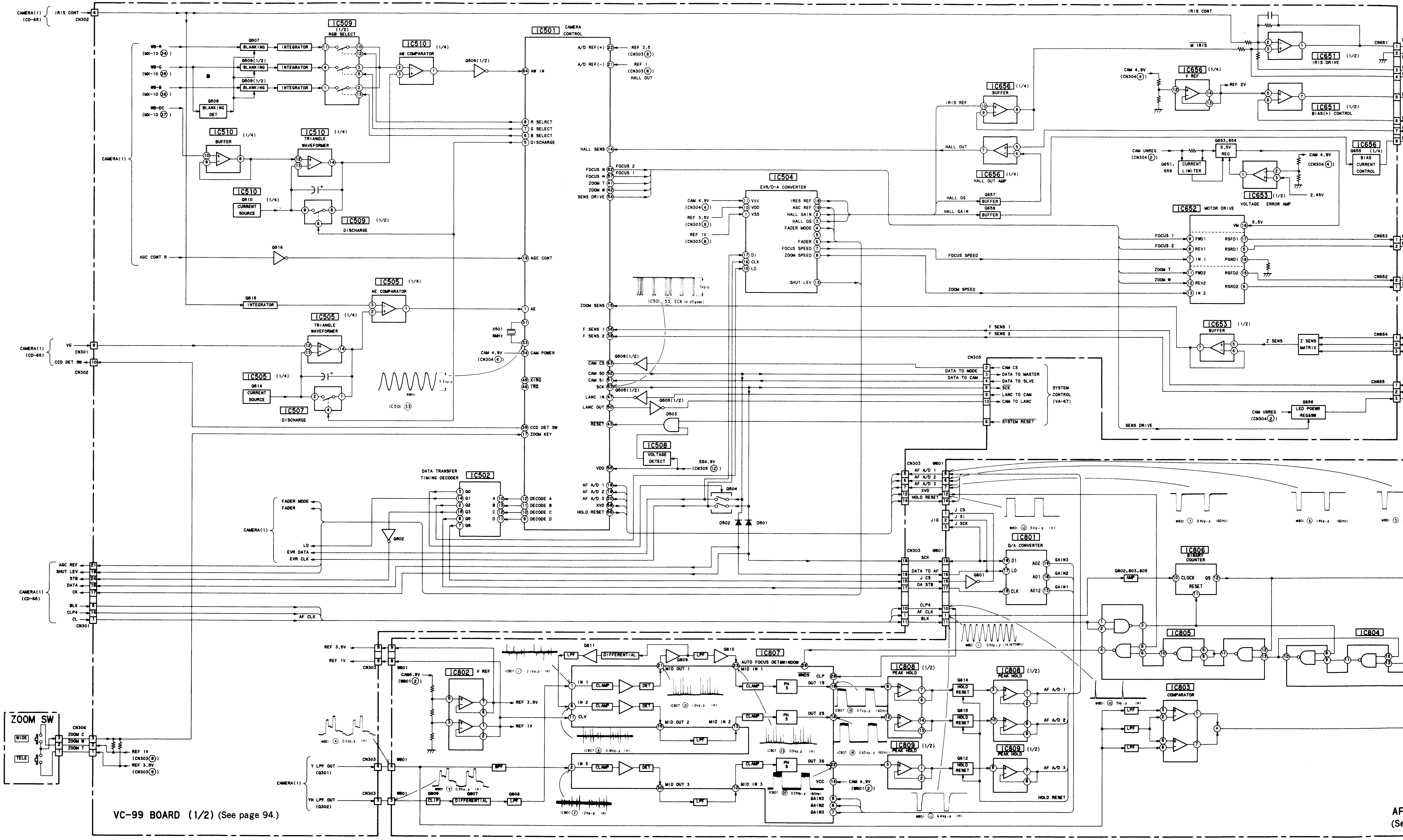
2. Pin Description

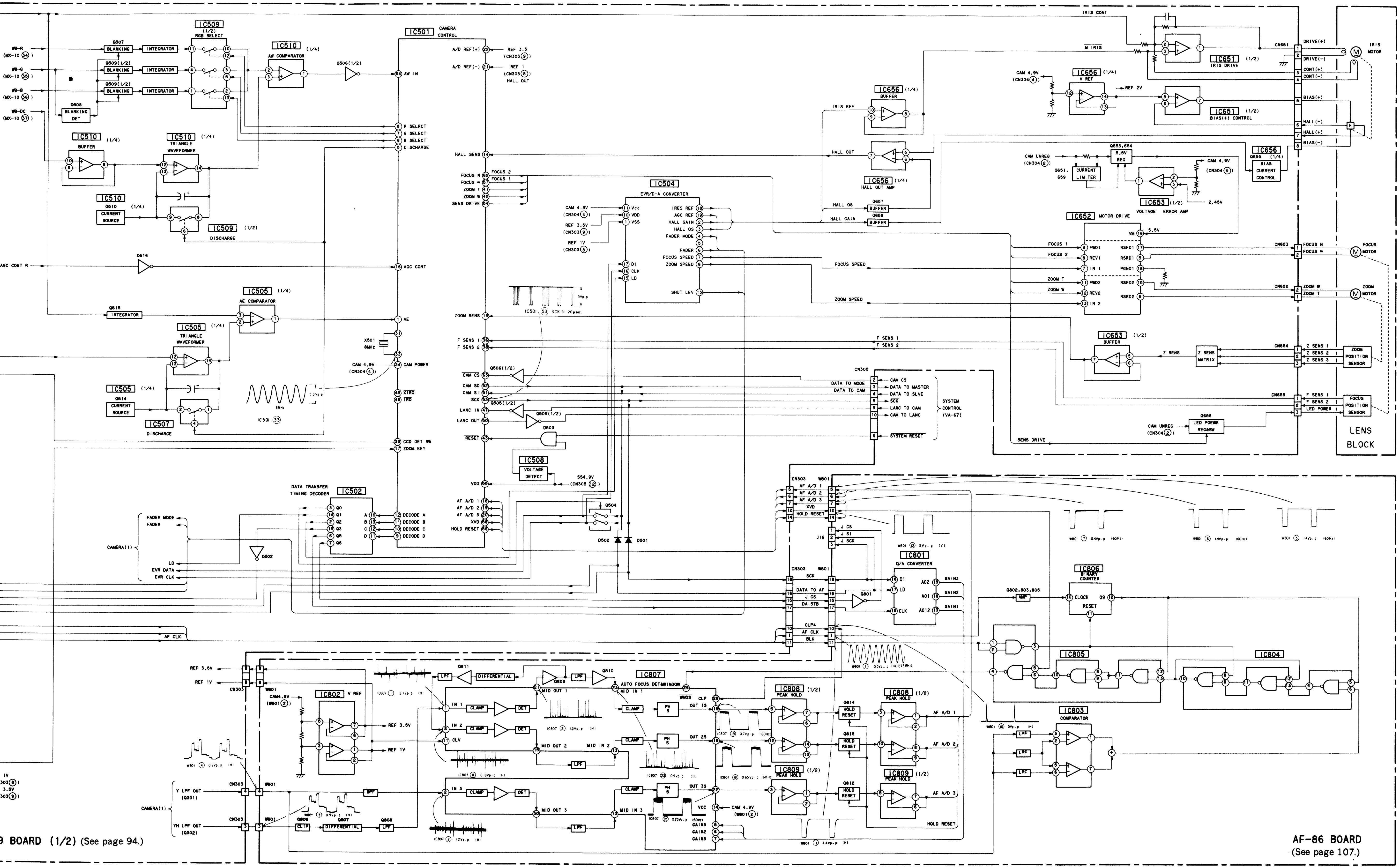
PIN No.	PIN Name	I/O	Function
1	AE	I	AE Integration-type A/D converter comparator input
2	NC	—	——
3	NC	—	——
4	NC	—	——
5	DISCHG	O	AWB. AE Integration-type A/D reset pulse
6	B SELECT	O	AWB Instrumentation line select pulse (blue)
7	G SELECT	O	AWB Instrumentation line select pulse (green)
8	R SELECT	O	AWB Instrumentation line select pulse (red)
9	DECODE D	O	Decode 4 to 10 and expand port with outside IC (4208)
10	DECODE C	O	Decode 4 to 10 and expand port with outside IC (4208)
11	DECODE B	O	Decode 4 to 10 and expand port with outside IC (4208)
12	DECODE A	O	Decode 4 to 10 and expand port with outside IC (4208)
13	NC	—	——
14	HALL SENS	I	Hall element voltage input (Analog input)
15	ZOOM SENS	I	Zoom position detection voltage input (Analog input)
16	AGC CONT	I	AGC voltage input (Analog input)
17	ZOOM KEY	I	Zoom switch voltage input (Analog input)
18	AF A/D 1	I	AF peak hold Data1 input (Analog input)
19	AF A/D 2	I	AF peak hold Data2 input (Analog input)
20	AF A/D 3	I	AF peak hold Data3 input (Analog input)
21	A/D REF(−)	—	Built-in A/D converter the minimum standard voltage (Analog input)
22	A/D REF(+)	—	Built-in A/D converter the minimum standard voltage (Analog input)
23	V_{SS}	—	GND
24	V_{SS}	—	GND
25	MODE B	I	Pull up to SS4.9V
26	NC	—	——
27	MODA	I	Pull down to GND
28	STR A	—	NC Not used
29	E	—	NC Not used
30	STR B	—	NC Not used

PIN No.	PIN Name	I/O	Function
31	EXTAL	O	Built-in inverter output for oscillating element
32	NC	—	——
33	XTAL	I	Built-in inverter input for oscillating element
34	CAM POWER	I	Camera power source rise supervision
35	NC	—	——
36	F SENS1	I	Focus sensor 1 voltage entrance (Analog input)
37	PC2	I	Pull up to SS4.9V
38	F SENS2	I	Focus sensor 2 voltage entrance (Analog input)
39	CCD DET SW	O	CCD DET switch select
40	$\overline{\text{MAN IRIS}}$	O	NC
41	ZOOM T	O	Zoom motor T-direction rotating designation
42	ZOOM W	O	Zoom motor W-direction rotating designation
43	$\overline{\text{RESET}}$	I	Reset
44	NC	—	——
45	$\overline{\text{XIRQ}}$	I	Pull up to SS4.9V
46	$\overline{\text{IRQ}}$	I	Pull up to SS4.9V
47	LANC IN	I	LANC input
48	NC	—	——
49	V_{SS}	—	GND
50	LANC OUT	O	LANC output
51	CAM SI	I	Serial data input
52	CAM SO	O	Serial data output
53	SCK	O	Serial clock
54	SENS DRIVE	O	AF sensor Luminous pulse output
55	V_{DD}	—	SS4.9V
56	HOLD RESET	O	V Peak Hold reset pulse output
57	FOCUS ∞	O	Focus motor ∞-direction rotating designation
58	XVD	O	V frame for AF distance measurement
59	$\overline{\text{MAN GAIN}}$	O	NC
60	NC	—	——
61	NC	—	——
62	$\overline{\text{FOCUS N}}$	O	Focus motor N-direction rotating designation
63	$\overline{\text{CAMCS}}$	I	Camera chip select input
64	$\overline{\text{AW IN}}$	I	AWB Integration-type A/D converter comparator input

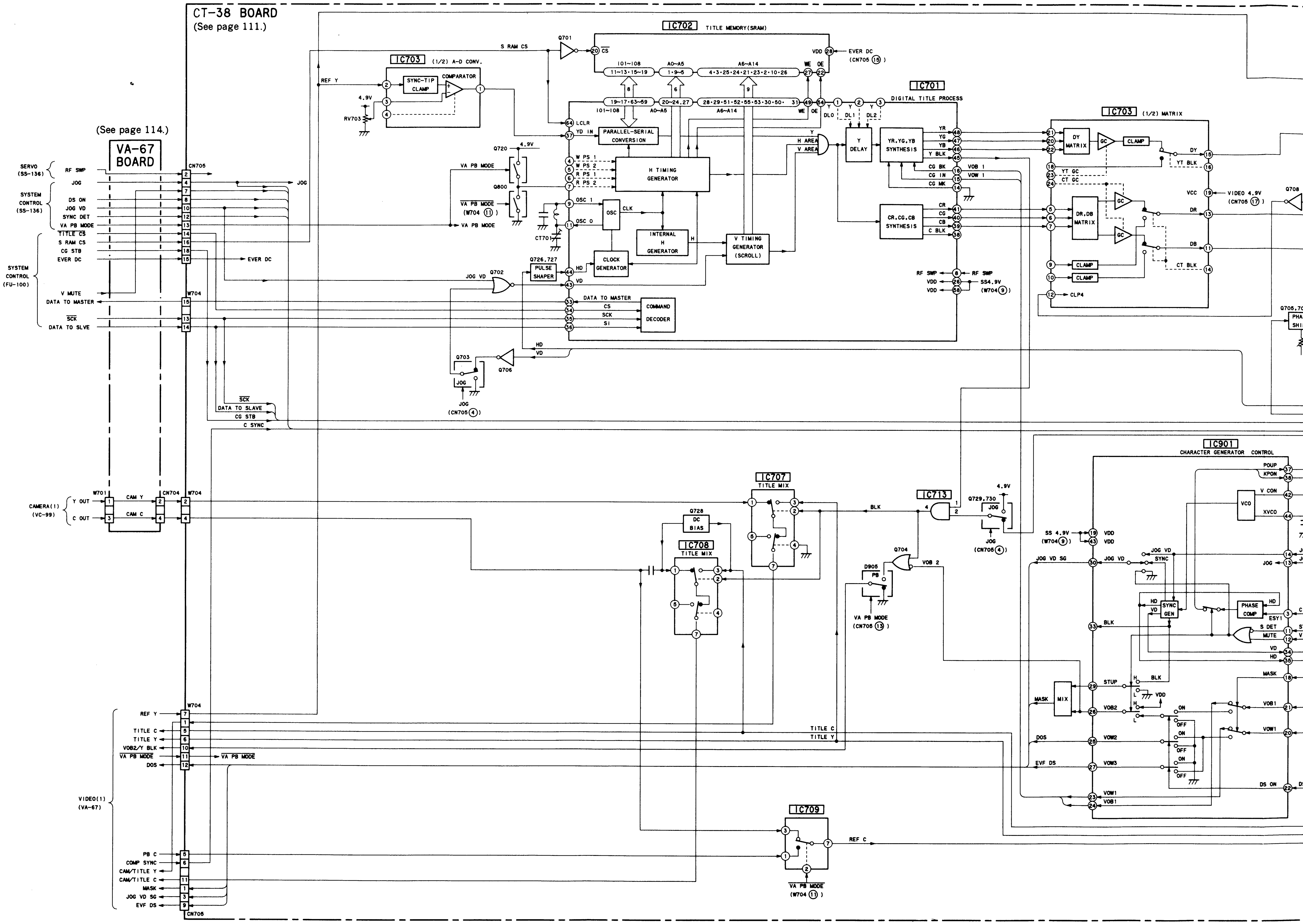
3-5. CAMERA

MERA (2) BLOCK DIAGRAM

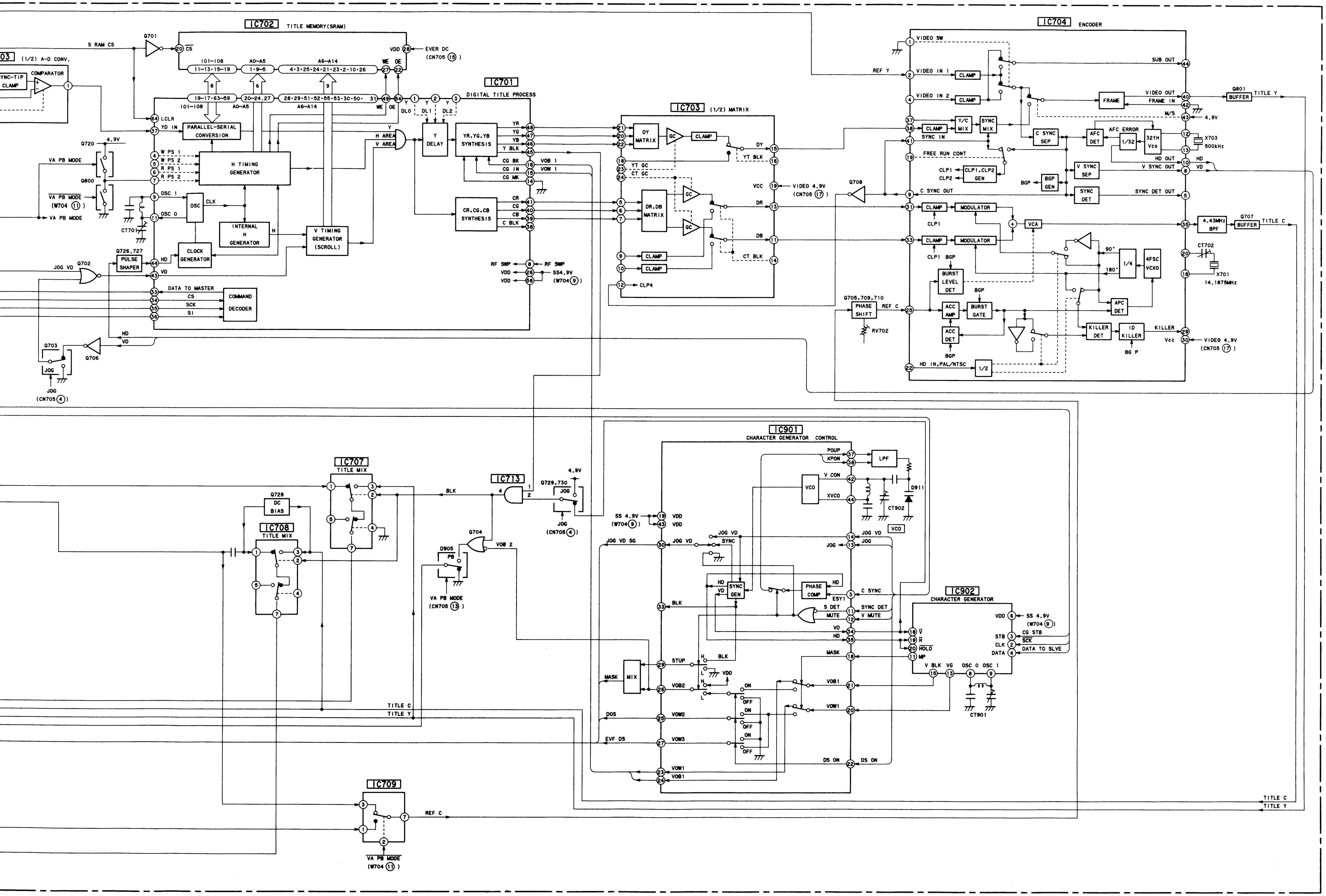

CAMERA(1) (CD-65)
IRIS CONT
CN302
WB-R (MX-10 54)
WB-G (MX-10 55)
WB-B (MX-10 56)
WB-DC (MX-10 57)
Q507
BLANKING
INTEGRATOR
Q509(1/2)
Q508
BLANKING DET
IC509 (1/2) RGB SELECT
IC510 (1/4) AW COMPARATOR
Q506(1/2)
IC501 CAMERA CONTROL
AW IN
R SELRCT
G SELECT
B SELECT
DISCHARGE
IC510 (1/4) BUFFER
IC510 (1/4) TRIANGLE WAVEFORMER
IC510 Q610 (1/4) CURRENT SOURCE
IC509 (1/2) DISCHARGE
CAMERA(1)
AGC CONT R
Q516
AGC CONT
IC505 (1/4) AE COMPARATOR
Q615 INTEGRATOR
AE
IC505 (1/4) TRIANGLE WAVEFORMER
X501 8MHz
CAM 4.9V (CN304 4)
CAM POWER
VG
CN301
CCD DET SW
IC505 (1/4) Q614 CURRENT SOURCE
IC507 DISCHARGE
8MHz
IC501 33
XTRQ
TRQ
CCD DET SW
ZOOM KEY
A/D REF(+)
A/D REF(-)
REF 3.5 (CN303 9)
REF 1 (CN303 8)
HALL OUT
HALL SENS
FOCUS N
FOCUS W
ZOOM T
ZOOM W
SENS DRIVE
FOCUS 2
FOCUS 1
IC504 EVR/D-A CONVERTER
CAM 4.9V (CN304 4)
REF 3.5V (CN303 9)
REF 1V (CN303 8)
Vcc
VDD
VSS
DI
CLK
LD
IRES REF
AGC REF
HALL GAIN
HALL OS
FADER MODE
FADER
FOCUS SPEED
ZOOM SPEED
SHUT LEV
IC501 53 SCK (H 20μsec)
ZOOM SENS
F SENS 1
F SENS 2
CAM CS
CAM SO
CAM SI
SCK
LANC IN
LANC OUT
RESET
Q506(1/2)
Q505(1/2)
D503
IC508 VOLTAGE DETECT
VDD
SS4.9V (CN305 12)
AF A/D 1
AF A/D 2
AF A/D 3
XVD
HOLD RESET
Q504
D502
D501
DATA TRANSFER TIMING DECODER
IC502
Q0 Q1 Q2 Q3 Q5 Q6
DECODE A
DECODE B
DECODE C
DECODE D
FADER MODE
FADER
LD
EVR DATA
EVR CLK
Q502
AGC REF
SHUT LEV
STB
DATA
CK
BLK
CLP4
CL
AF CLK
CN305
CAM CS
DATA TO MASTER
DATA TO SLVE
SCK
LANC TO CAM
CAM TO LANC
SYSTEM RESET
DATA TO MODE
DATA TO CAM
SYSTEM CONTROL (VA-67)
IRIS CONT
M IRIS
IC651 (1/2) IRIS DRIVE
CN651
CAM 4.9V (CN304 4)
IC656 (1/4) V REF
REF 2V
IC651 (1/2) BIAS(+) CONTROL
IC656 (1/4) BUFFER
IRIS REF
HALL OUT
IC656 (1/4) HALL OUT AMP
HALL OS
HALL GAIN
Q657 BUFFER
Q658 BUFFER
CAM UNREG (CN304 2)
Q651, 659 CURRENT LIMITER
Q653,654 5.5V REG
CAM 4.9V (CN304 4)
IC653 (1/2) VOLTAGE ERROR AMP
2.45V
IC656 Q655 (1/4) BIAS CURRENT CONTROL
IC652 MOTOR DRIVE
VM
5.5V
FWD1
REV1
IN 1
FWD2
REV2
IN 2
RSFD1
RSRD1
PGND1
RSFD2
RSRD2
CN653
CN652
FOCUS SPEED
ZOOM SPEED
IC653 (1/2) BUFFER
Z SENS
Z SENS MATRIX
CN654
CN655
CAM UNREG (CN304 2)
Q656 LED POEWR REG&SW
SENS DRIVE
CN303
W801
JIG
J CS
J SI
J SCK
IC801 D/A CONVERTER
GAIN3
GAIN2
GAIN1
A02
A01
A012
DATA TO AF
DA STB
Q801
CLP4
AF CLK
BLK
Q802,803,805 AMP
IC806 BINARY COUNTER
CLOCK
Q9
RESET
IC805
IC804
W801 7 0.4Vp-p (60Hz)
W801 6 1.4Vp-p (60Hz)
W801 5
W801 12 5Vp-p (V)
W801 1 0.5Vp-p (14.1875MHz)
REF 3.5V
REF 1V
Q811 LPF DIFFERENTIAL
Q809
Q810 LPF
IC807 AUTO FOCUS DETA WINDOW
MID IN 1
MID OUT 1
IN 1
IN 2
CLV
CLAMP
DET
MID OUT 2
MID IN 2
IN 3
MID OUT 3
MID IN 3
LPF
CLP
WNDS
OUT 1S
OUT 2S
OUT 3S
PH S
VCC
CAM 4.9V (W801 2)
GAIN3
GAIN2
GAIN1
IC802 V REF
CAM4.9V (W801 2)
IC808 (1/2) PEAK HOLD
IC809 (1/2) PEAK HOLD
Q814 HOLD RESET
Q815 HOLD RESET
Q812 HOLD RESET
AF A/D 1
AF A/D 2
AF A/D 3
HOLD RESET
IC803 COMPARATOR
BPF
Y LPF OUT (Q301)
YH LPF OUT (Q302)
Q806 CLIP
Q807 DIFFERENTIAL
Q808 LPF
W801 3 0.9Vp-p (H)
W801 4 0.2Vp-p (H)
W801 11 4.4Vp-p (H)
IC807 1 2.1Vp-p (H)
IC807 21 1.3Vp-p (H)
IC807 9 0.7Vp-p (60Hz)
IC807 8 0.65Vp-p (60Hz)
IC807 23 0.9Vp-p (H)
IC807 20 0.23Vp-p (60Hz)
IC807 5 0.18Vp-p (H)
IC807 2 1.2Vp-p (H)
ZOOM SW
WIDE
TELE
CN306
ZOOM C
ZOOM W
ZOOM T
REF 1V (CN303 8)
REF 3.5V (CN303 9)
VC-99 BOARD (1/2) (See page 94.)
AF
(Se


IC509 (1/2) RGB SELECT
IC510 (1/4) AW COMPARATOR
IC501 CAMERA CONTROL
IC510 (1/4) BUFFER
IC510 (1/4) TRIANGLE WAVEFORMER
IC510 (1/4) CURRENT SOURCE
IC509 (1/2) DISCHARGE
IC505 (1/4) AE COMPARATOR
IC505 (1/4) TRIANGLE WAVEFORMER
IC505 (1/4) CURRENT SOURCE
IC507 DISCHARGE
IC504 EVR/D-A CONVERTER
IC502 DATA TRANSFER TIMING DECODER
IC508 VOLTAGE DETECT
IC656 (1/4) BUFFER
IC656 (1/4) HALL OUT AMP
IC656 (1/4) V REF
IC656 (1/4) BIAS CURRENT CONTROL
IC651 (1/2) IRIS DRIVE
IC651 (1/2) BIAS(+) CONTROL
IC653 (1/2) VOLTAGE ERROR AMP
IC652 MOTOR DRIVE
IC653 (1/2) BUFFER
Z SENS MATRIX
LED POEWR REG&SW
IRIS MOTOR
FOCUS MOTOR
ZOOM MOTOR
ZOOM POSITION SENSOR
FOCUS POSITION SENSOR
LENS BLOCK
SYSTEM CONTROL (VA-67)
IC801 D/A CONVERTER
IC806 BINARY COUNTER
IC805
IC804
IC803 COMPARATOR
IC802 V REF
IC807 AUTO FOCUS DET&WINDOW
IC808 (1/2) PEAK HOLD
IC809 (1/2) PEAK HOLD
WB-R (MX-10 54)
WB-G (MX-10 55)
WB-B (MX-10 56)
WB-DC (MX-10 57)
AGC CONT R
CAMERA(1)
FADER MODE
FADER
LD
EVR DATA
EVR CLK
AF CLK
REF 3.6V
REF 1V
Y LPF OUT (Q301)
YH LPF OUT (Q302)
IC501 53 SCK (H 20μsec)
IC501 33
WB01 7 0.4Vp-p (60Hz)
WB01 6 1.4Vp-p (60Hz)
WB01 5 1.4Vp-p (60Hz)
WB01 9 5Vp-p (V)
WB01 11 4.4Vp-p (H)
9 BOARD (1/2) (See page 94.)
AF-86 BOARD
(See page 107.)

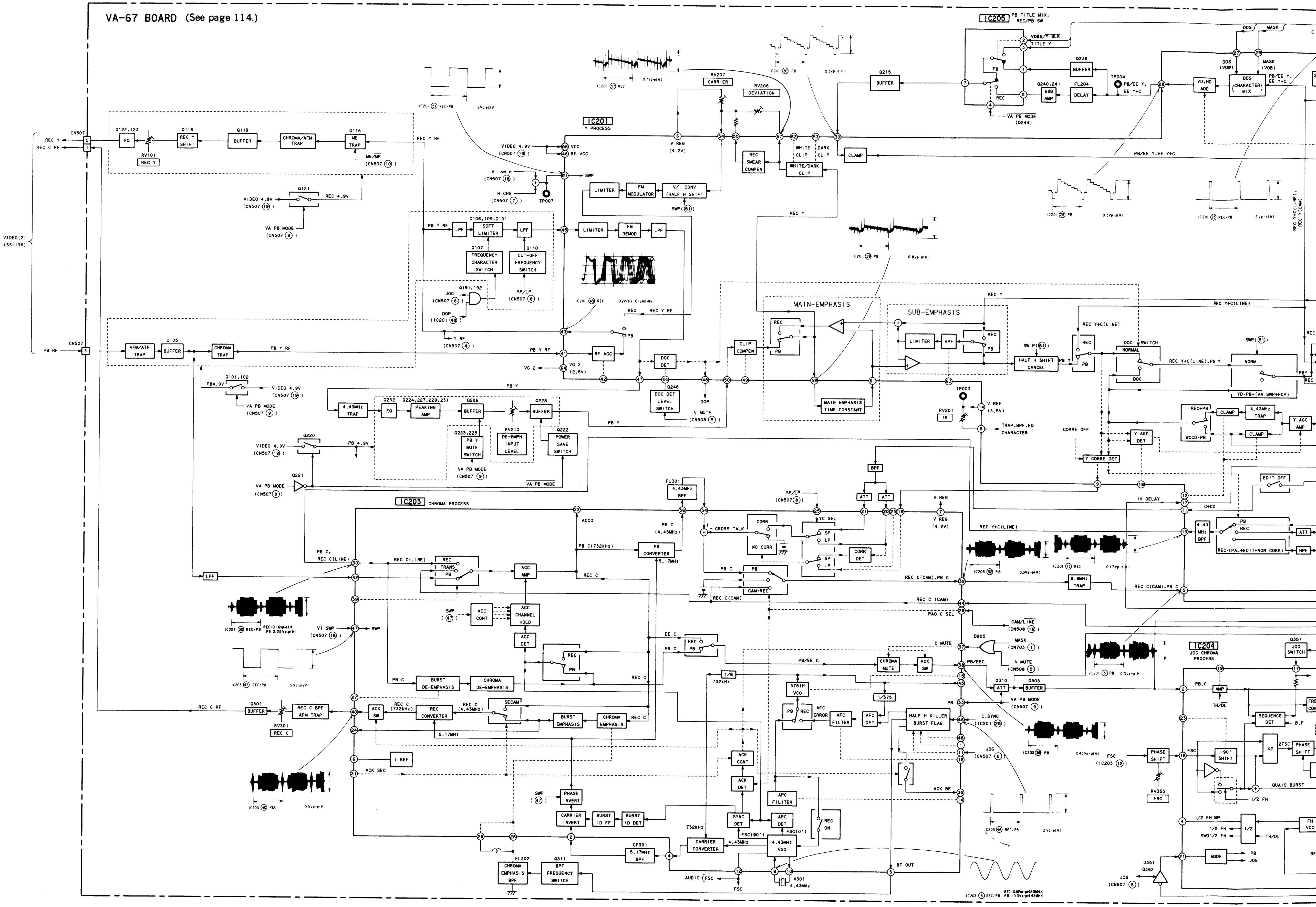
3-6. DIGITAL TITLER BLOCK DIAGRAM

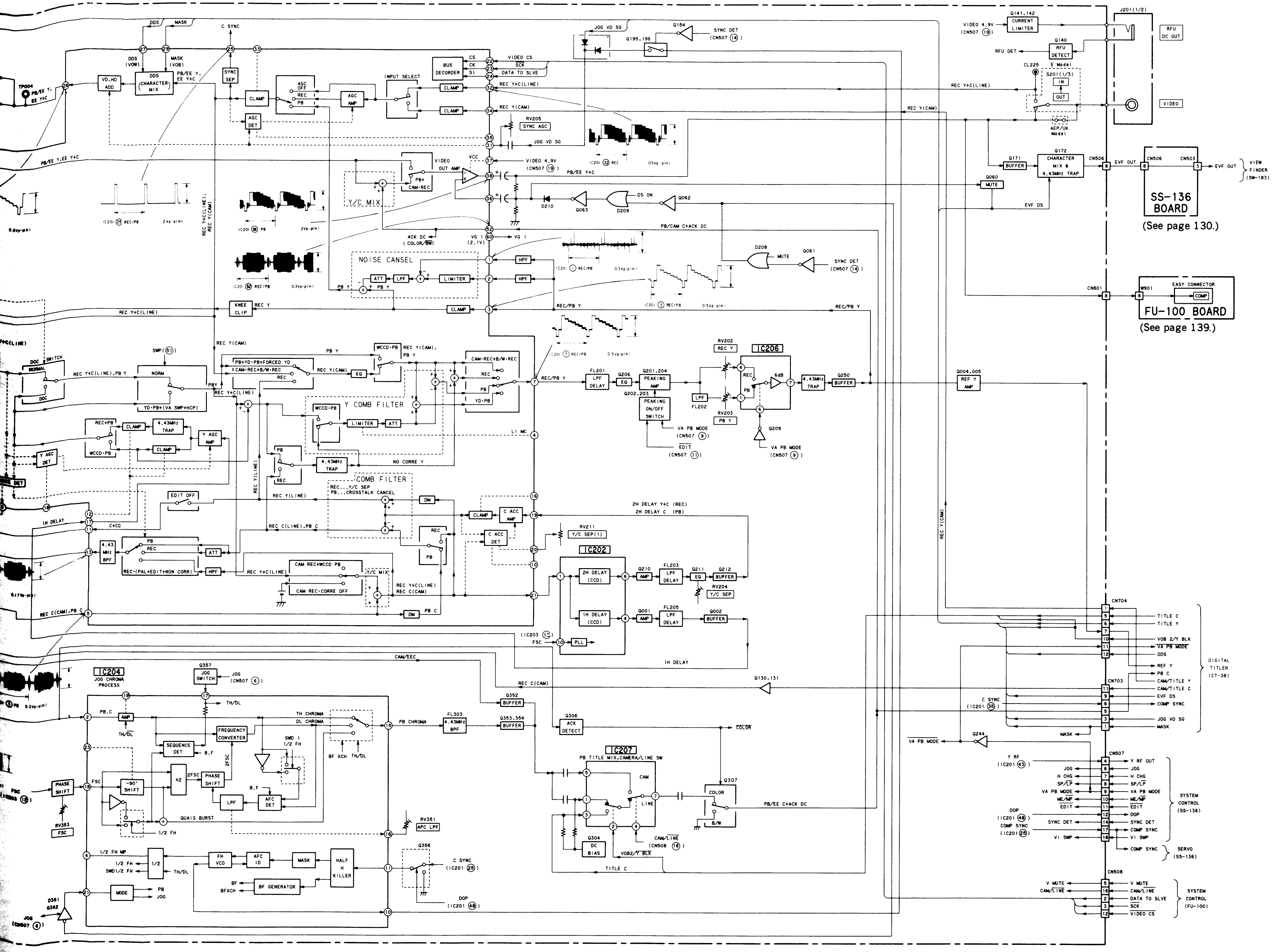


CT-38 BOARD
(See page 111.)
(See page 114.)
VA-67 BOARD
IC702 TITLE MEMORY(SRAM)
IC703 (1/2) A-D CONV.
SYNC-TIP CLAMP
COMPARATOR
RV703
S RAM CS
Q701
EVER DC (CN705 ⑮)
IC701 DIGITAL TITLE PROCESS
PARALLEL-SERIAL CONVERSION
H TIMING GENERATOR
OSC
CLOCK GENERATOR
INTERNAL H GENERATOR
V TIMING GENERATOR (SCROLL)
PULSE SHAPER
Q726,727
COMMAND DECODER
DATA TO MASTER
CS
SCK
SI
Y DELAY
YR,YG,YB SYNTHESIS
CR,CG,CB SYNTHESIS
IC703 (1/2) MATRIX
DY MATRIX
DR,DB MATRIX
GC
CLAMP
YT BLK
CT BLK
VIDEO 4.9V (CN705 ⑰)
CLP4
Q708
Q705,7
RF SWP
SS4.9V (W704 ⑨)
Q720
Q800
VA PB MODE
(W704 ⑪)
CT701
Q702
JOG VD
Q703
Q706
JOG (CN705 ④)
SERVO (SS-136)
SYSTEM CONTROL (SS-136)
SYSTEM CONTROL (FU-100)
RF SWP
JOG
DS ON
JOG VD
SYNC DET
VA PB MODE
TITLE CS
S RAM CS
CG STB
EVER DC
V MUTE
DATA TO MASTER
SCK
DATA TO SLVE
CN705
W704
SCK
DATA TO SLAVE
CG STB
C SYNC
CAMERA(1) (VC-99)
Y OUT
C OUT
W701
CAM Y
CAM C
CN704
IC707 TITLE MIX
IC708 TITLE MIX
Q728 DC BIAS
IC713
BLK
Q729,730
Q704
VOB 2
D905 PB
VA PB MODE (CN705 ⑬)
IC901 CHARACTER GENERATOR CONTROL
POUP
KPON
V CON
VCO
XVCO
SS 4.9V (W704 ⑨)
VDD
JOG VD SG
JOG VD
SYNC
SYNC GEN
PHASE COMP
ESY1
S DET
MUTE
VD
HD
MASK
MIX
STUP
VOB2
VOW2
VOW3
VOW1
VOB1
DOS
EVF DS
DS ON
ON
OFF
REF Y
TITLE C
TITLE Y
VOB2/Y BLK
VA PB MODE
DOS
VIDEO(1) (VA-67)
PB C
COMP SYNC
CAM/TITLE Y
CAM/TITLE C
MASK
JOG VD SG
EVF DS
IC709
REF C
VA PB MODE (W704 ⑪)

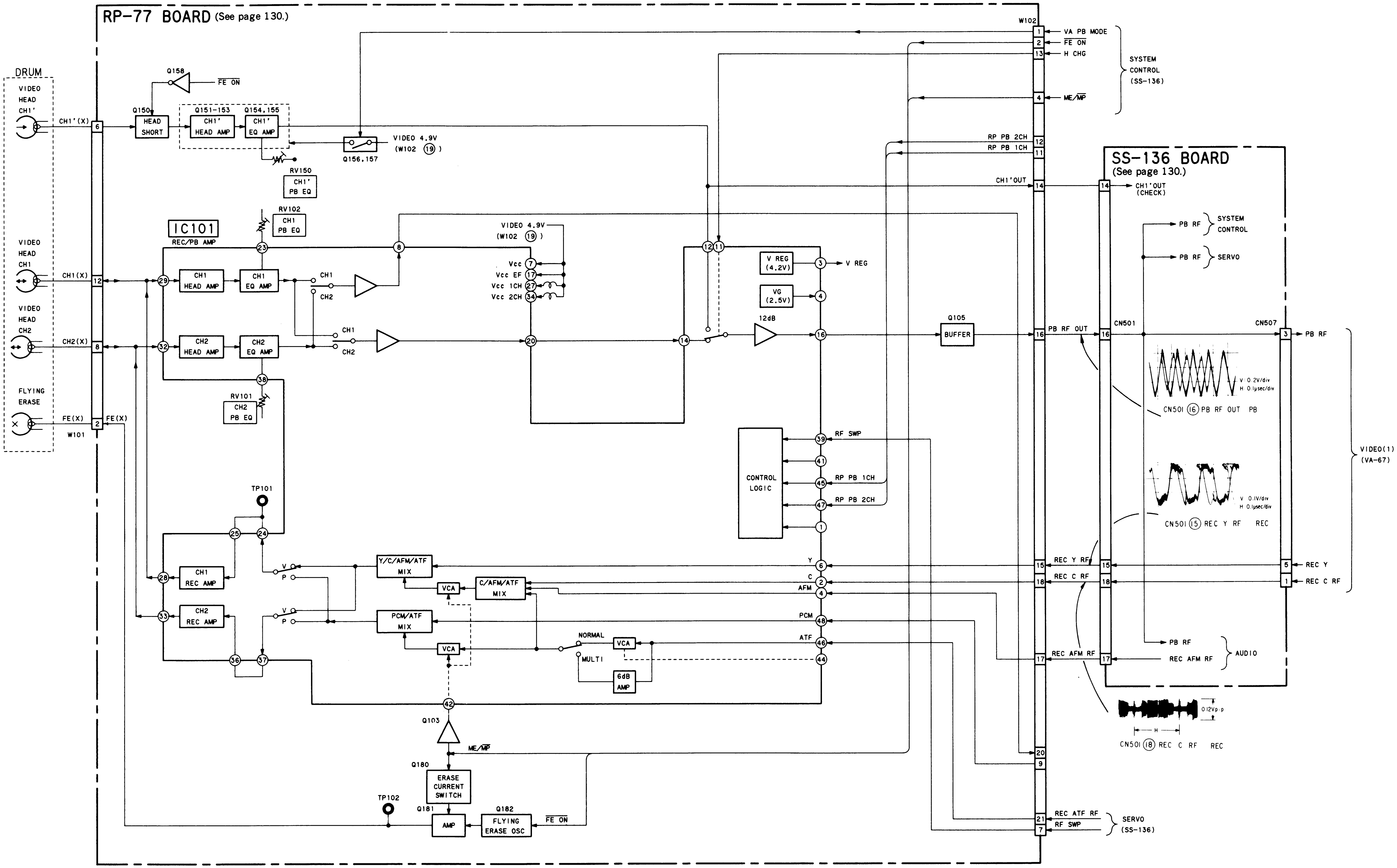

IC702 TITLE MEMORY(SRAM)
IC701 DIGITAL TITLE PROCESS
IC703 (1/2) MATRIX
IC704 ENCODER
IC707 TITLE MIX
IC708 TITLE MIX
IC709
IC713
IC901 CHARACTER GENERATOR CONTROL
IC902 CHARACTER GENERATOR
(1/2) A-D CONV.
SYNC-TIP CLAMP
COMPARATOR
S RAM CS
Q701
EVER DC (CN705 ⑮)
PARALLEL-SERIAL CONVERSION
H TIMING GENERATOR
V TIMING GENERATOR (SCROLL)
INTERNAL H GENERATOR
CLOCK GENERATOR
OSC
PULSE SHAPER
COMMAND DECODER
DATA TO MASTER
CS
SCK
SI
Y DELAY
YR,YG,YB SYNTHESIS
CR,CG,CB SYNTHESIS
DY MATRIX
DR,DB MATRIX
GC
CLAMP
YT GC
CT GC
YT BLK
CT BLK
CLP4
VIDEO 4.9V (CN705 ⑰)
RF SWP
SS4.9V (W704 ⑨)
Q720
Q800
VA PB MODE
(W704 ⑪)
CT701
Q726,727
JOG VD
Q702
Q703
Q706
JOG (CN705 ④)
VIDEO SW
REF Y
VIDEO IN 1
VIDEO IN 2
Y/C MIX
SYNC MIX
SYNC IN
C SYNC SEP
AFC DET
AFC ERROR
1/32
321H Vco
X703 500kHz
FRAME
SUB OUT
VIDEO OUT
FRAME IN
M/S
Q801 BUFFER
TITLE Y
FREE RUN CONT
CLP1,CLP2 GEN
BGP GEN
V SYNC SEP
SYNC DET
HD OUT
V SYNC OUT
SYNC DET OUT
C SYNC OUT
Q708
MODULATOR
VCA
4.43MHz BPF
Q707 BUFFER
TITLE C
CT702
X701 14.1875MHz
90°
180°
1/4
4FSC VCXO
BURST LEVEL DET
ACC AMP
BURST GATE
APC DET
ACC DET
KILLER DET
ID KILLER
BG P
KILLER
Q705,709,710
PHASE SHIFT
REF C
RV702
HD IN,PAL/NTSC
1/2
Q728 DC BIAS
BLK
Q729,730
4.9V
JOG (CN705 ④)
Q704
VOB 2
D905 PB
VA PB MODE (CN705 ⑬)
POUP
XPON
LPF
VCO
V CON
XVCO
D911
CT902
SS 4.9V (W704 ⑨)
VDD
JOG VD SG
JOG VD
SYNC
SYNC GEN
PHASE COMP
ESYI
C SYNC
S DET
MUTE
SYNC DET
V MUTE
HD
VD
STUP
MASK
MIX
VOB2
VOB1
VOW1
VOW2
VOW3
DOS
EVF DS
ON
OFF
DS ON
SS 4.9V (W704 ⑨)
CG STB
SCK
DATA TO SLVE
STB
CLK
DATA
HOLD
MP
V BLK
VG
OSC 0
OSC 1
CT901
TITLE C
TITLE Y
REF C
VA PB MODE (W704 ⑪)

3-7. VIDEO (1) BLOCK DIAGRAM


VA-67 BOARD (See page 114.)
VIDEO(2) (SS-136)
REC Y
REC C RF
PB RF
CN507
Q122,123 EQ
RV101 REC Y
Q116 REC Y SHIFT
Q119 BUFFER
CHROMA/AFM TRAP
Q115 ME TRAP
ME/MP (CN507 ⑩)
REC Y RF
Q121
VIDEO 4.9V (CN507 ⑲)
VA PB MODE (CN507 ⑨)
REC 4.9V
AFM/ATF TRAP
Q105 BUFFER
CHROMA TRAP
PB Y RF
Q101,102
PB4.9V
4.43MHz TRAP
Q232 EQ
Q224,227,229,231 PEAKING AMP
Q226 BUFFER
Q228 BUFFER
Q223,225 PB Y MUTE SWITCH
RV210 DE-EMPH INPUT LEVEL
Q222 POWER SAVE SWITCH
Q220
Q221
IC201 Y PROCESS
VIDEO 4.9V
VCC
RF VCC
VI SWP
H CHG
TP007
SWP
LIMITER
FM MODULATOR
V/I CONV (HALF H SHIFT)
SWP(51)
Q106,109,D101 SOFT LIMITER
LPF
Q107 FREQUENCY CHARACTER SWITCH
Q110 CUT-OFF FREQUENCY SWITCH
SP/LP (CN507 ⑧)
Q191,192
JOG (CN507 ⑥)
DOP (IC201 ㊽)
FM DEMOD
RF AGC
VG 2 (2.5V)
Y RF (CN507 ④)
DOC DET
Q248 DOC DET LEVEL SWITCH
DOP
V MUTE (CN508 ⑤)
CLIP COMPEN
RV207 CARRIER
RV206 DEVIATION
V REG (4.2V)
REC SMEAR COMPEN
WHITE CLIP
DARK CLIP
WHITE/DARK CLIP
CLAMP
MAIN-EMPHASIS
MAIN EMPHASIS TIME CONSTANT
SUB-EMPHASIS
HPF
HALF H SHIFT CANCEL
SW P(51)
TP003
V REF (3.5V)
RV201 IR
TRAP,BPF,EQ CHARACTER
Q215 BUFFER
IC205 PB TITLE MIX, REC/PB SW
VOB2/Y BLK
TITLE Y
Q238 BUFFER
Q240,241 6dB AMP
FL204 DELAY
TP004 PB/EE Y, EE Y+C
VA PB MODE (Q244)
VD,HD ADD
DDS (VOW)
MASK (VOB)
DDS (CHARACTER) MIX
PB/EE Y, EE Y+C
PB/EE Y,EE Y+C
REC Y+C(LINE)
DOC SWITCH
NORMAL
REC Y+C(LINE),PB Y
NORM
YD·PB+(VA SWP+HCP)
CORRE OFF
Y CORRE DET
Y AGC DET
REC+PB
WCCD·PB
4.43MHz TRAP
Y AGC AMP
EDIT OFF
1H DELAY
C+CD
4.43 MHz BPF
REC·(PAL+EDIT+NON CORR)
ATT
HPF
REC Y+C(LINE), REC Y(CAM)
IC203 CHROMA PROCESS
ACCO
FL301 4.43MHz BPF
SP/LP (CN507⑧)
CROSS TALK
CORR
NO CORR
CORR DET
PB C (4.43MHz)
PB C(732kHz)
PB CONVERTER
5.17MHz
PB C, REC C(LINE)
REC C(LINE)
REC TRANS PB
ACC AMP
ACC CONT
ACC CHANNEL HOLD
ACC DET
VI SWP (CN507 ⑱)
CAM-REC
REC C(CAM)
PAO C SEL
CAM/LINE (CN508 ⑯)
C MUTE
D205
MASK (CN703 ①)
V MUTE (CN508 ⑤)
EE C
PB C
PB/EE C
CHROMA MUTE
ACK SW
PB/EEC
Q310 ATT
Q303 BUFFER
VA PB MODE (CN507 ⑨)
1/8
732kHz
375fH VCO
1/375
AFC ERROR
AFC FILTER
AFC DET
HALF H KILLER BURST FLAG
C.SYNC (IC201 ㉕)
JOG (CN507 ⑥)
BURST DE-EMPHASIS
CHROMA DE-EMPHASIS
SECAM
REC C (732kHz)
REC C (4.43MHz)
REC CONVERTER
BURST EMPHASIS
CHROMA EMPHASIS
Q301 BUFFER
REC C BPF AFM TRAP
RV301 REC C
I REF
ACK SEC
ACK CONT
ACK DET
PHASE INVERT
CARRIER INVERT
BURST ID FF
BURST ID DET
SYNC DET
APC DET
APC FILTER
FSC(90°)
FSC(0°)
REC ON
4.43MHz VXO
CARRIER CONVERTER
CF301 5.17MHz BPF
FL302 CHROMA EMPHASIS BPF
Q311 BPF FREQUENCY SWITCH
AUDIO FSC
X301 4.43MHz
BF OUT
ACK BF
IC204 JOG CHROMA PROCESS
Q357 JOG SWITCH
PHASE SHIFT
RV353 FSC
FSC (IC203 ⑫)
-90° SHIFT
X2
2FSC PHASE SHIFT
SEQUENCE DET
QUAIS BURST
1/2 FH
1/2 FH MP
SWD1/2 FH
TH/DL
MODE
PB JOG
D351 Q362
JOG (CN507 ⑥)
IC203 ㉚ REC/PB REC 0.16Vp-p(H) PB 0.25Vp-p(H)
IC203 ㊼ REC/PB 5Vp-p(V)
IC203 ㊵ REC 0.5Vp-p(H)
IC201 ⑤ REC/PB 1.6Vp-p(2V)
IC201 ㊼ REC 0.7Vp-p(H)
IC201 ㉚ PB 0.5Vp-p(H)
IC201 ㊸ REC 0.2V/div 0.1μsec/div
IC201 ㊾ PB 0.8Vp-p(H)
IC201 ㉘ PB 0.5Vp-p(H)
IC201 ㉙ REC/PB 2Vp-p(H)
IC203 ㉜ PB 0.5Vp-p(H)
IC201 ⑬ REC 0.17Vp-p(H)
IC201 ⑤ PB 0.3Vp-p(H)
IC203 ㊳ PB 0.45Vp-p(H)
IC203 ㊻ REC/PB 2Vp-p(H)
IC203 ⑧ REC/PB REC 0.6Vp-p(4.43MHz) PB 0.3Vp-p(4.43MHz)

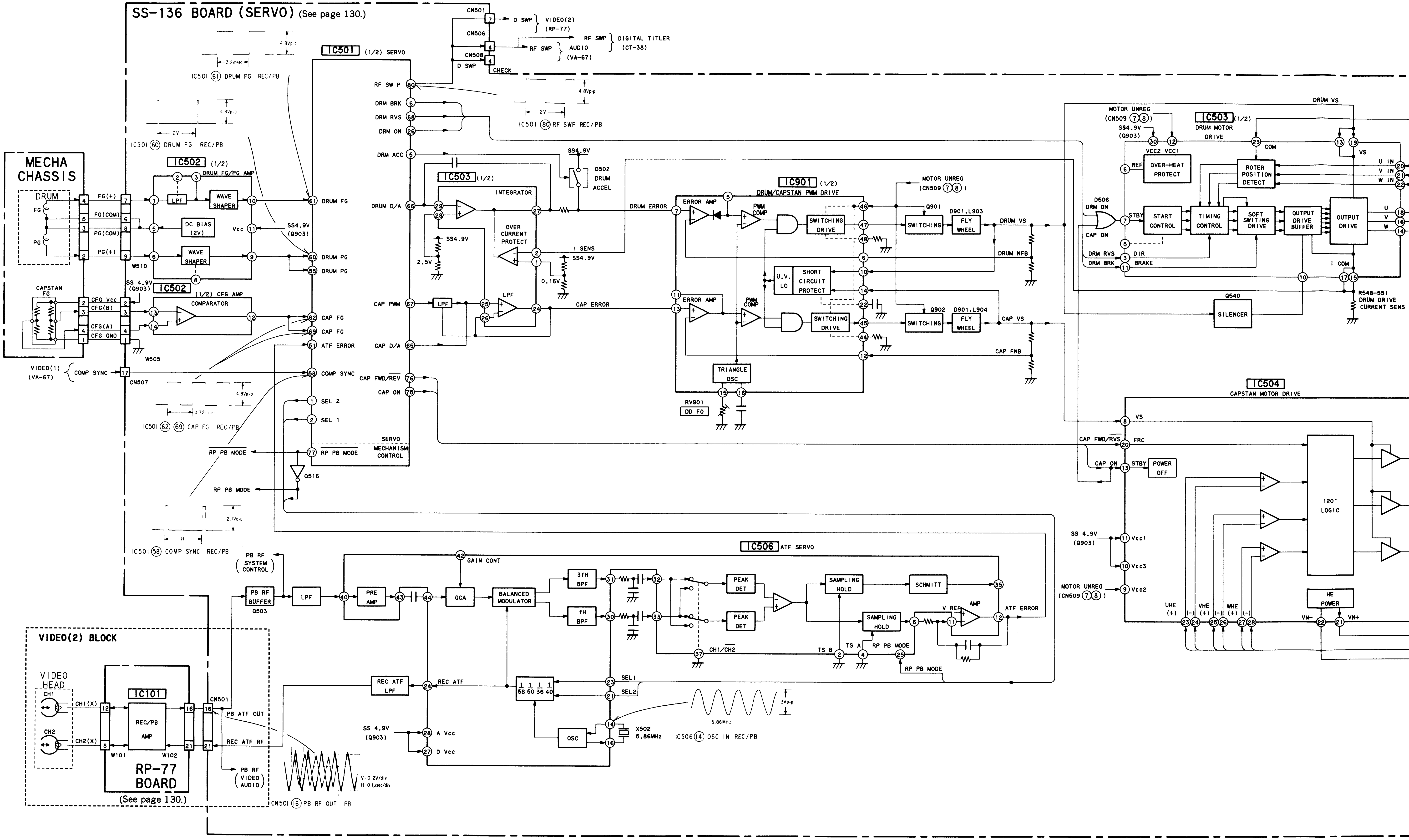

IC202
IC204
JOG CHROMA PROCESS
IC206
IC207
PB TITLE MIX,CAMERA/LINE SW
Y COMB FILTER
COMB FILTER
NOISE CANSEL
Y/C MIX
INPUT SELECT
BUS DECORDER
DDS CHARACTER MIX
VD,HD ADD
SYNC SEP
CLAMP
AGC AMP
AGC DET
KNEE CLIP
LIMITER
ATT
LPF
HPF
EQ
PEAKING AMP
PEAKING ON/OFF SWITCH
4.43MHz TRAP
BUFFER
REF Y AMP
2H DELAY (CCD)
1H DELAY (CCD)
LPF DELAY
PLL
C ACC AMP
C ACC DET
ACK DETECT
COLOR
DC BIAS
SEQUENCE DET
FREQUENCY CONVERTER
PHASE SHIFT
AFC DET
FH VCO
AFC ID
MASK
HALF H KILLER
BF GENERATOR
MODE
CURRENT LIMITER
RFU DETECT
CHARACTER MIX & 4.43MHz TRAP
MUTE
SS-136 BOARD
(See page 130.)
FU-100 BOARD
(See page 139.)
EASY CONNECTOR
VIEW FINDER (SW-183)
DIGITAL TITLER (CT-38)
SYSTEM CONTROL (SS-136)
SERVO (SS-136)
SYSTEM CONTROL (FU-100)
RFU DC OUT
VIDEO
EVF OUT
CN704
CN703
CN507
CN508
CN506
CN503
CN801
J201(1/2)
TP004

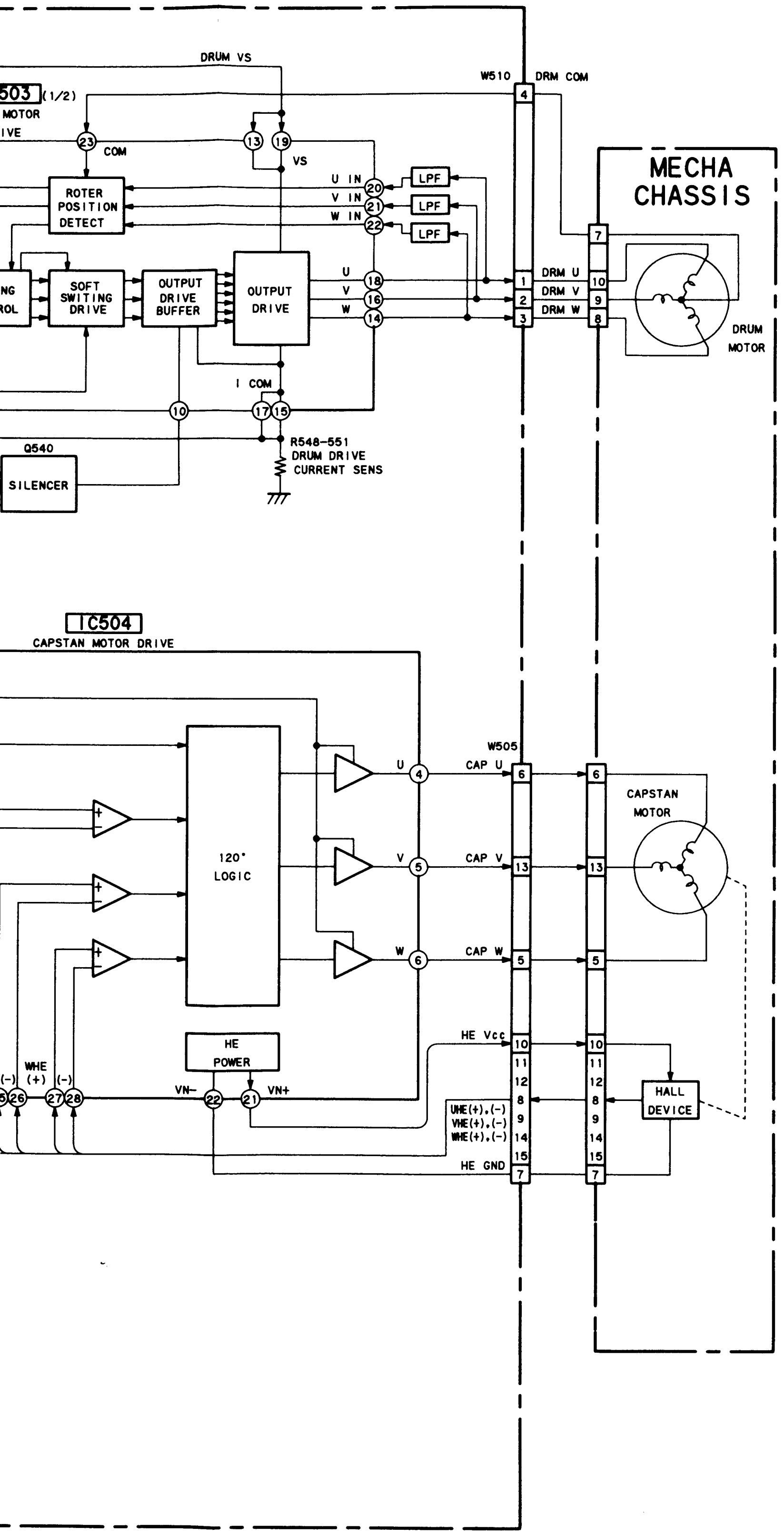
3-8. VIDEO (2) BLOCK DIAGRAM



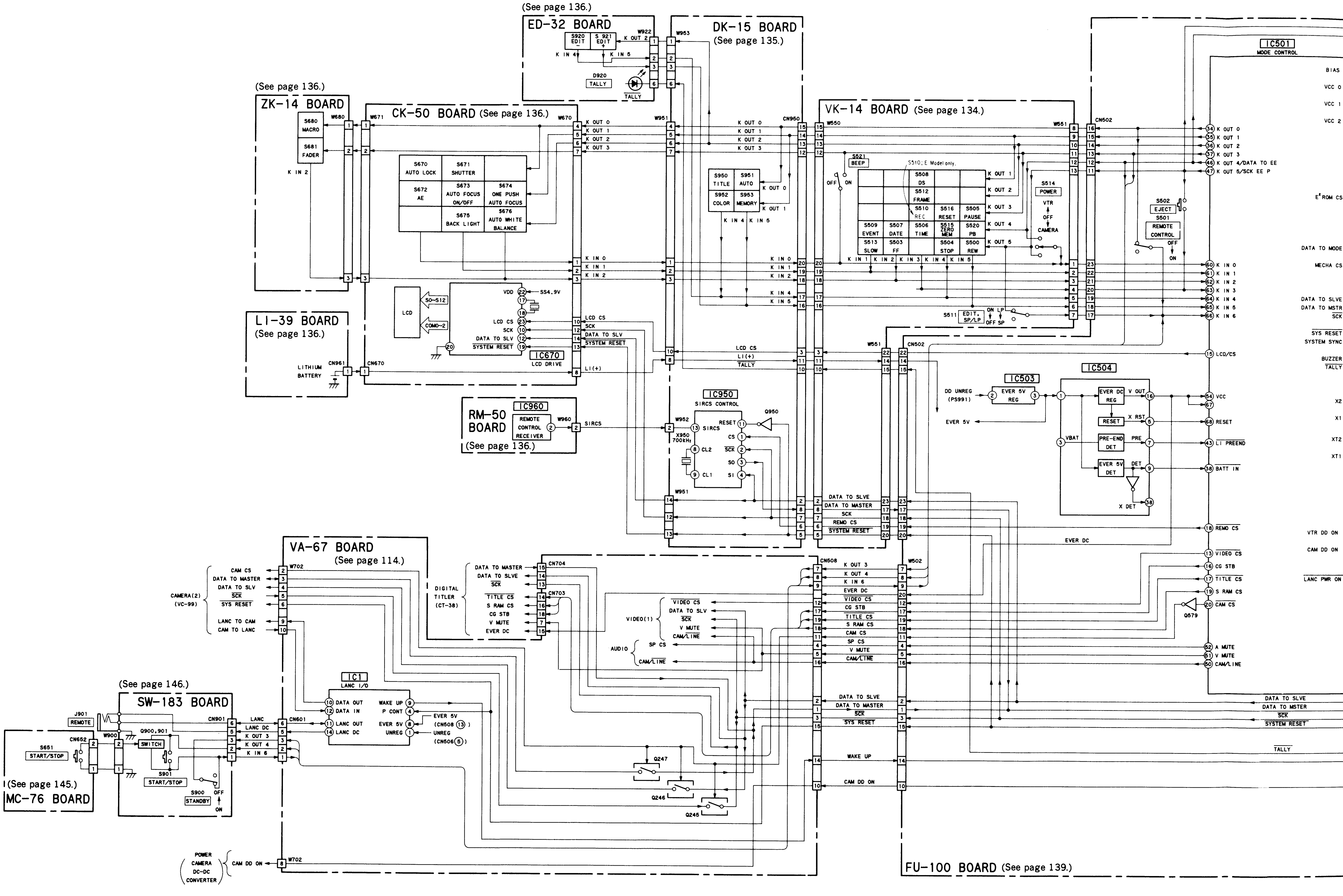
RP-77 BOARD (See page 130.)
DRUM
VIDEO HEAD CH1'
VIDEO HEAD CH1
VIDEO HEAD CH2
FLYING ERASE
CH1'(X)
CH1(X)
CH2(X)
FE(X)
W101
Q158
FE ON
Q150
HEAD SHORT
Q151-153
CH1' HEAD AMP
Q154,155
CH1' EQ AMP
Q156,157
VIDEO 4.9V (W102 ⑲)
RV150
CH1' PB EQ
RV102
CH1 PB EQ
IC101
REC/PB AMP
CH1 HEAD AMP
CH1 EQ AMP
CH2 HEAD AMP
CH2 EQ AMP
RV101
CH2 PB EQ
CH1
CH2
Vcc
Vcc EF
Vcc 1CH
Vcc 2CH
V REG (4.2V)
VG (2.5V)
V REG
12dB
Q105
BUFFER
CONTROL LOGIC
RF SWP
RP PB 1CH
RP PB 2CH
TP101
CH1 REC AMP
CH2 REC AMP
Y/C/AFM/ATF MIX
C/AFM/ATF MIX
PCM/ATF MIX
VCA
NORMAL
MULTI
6dB AMP
Y
C
AFM
PCM
ATF
V
P
Q103
ME/MP
Q180
ERASE CURRENT SWITCH
TP102
Q181
AMP
Q182
FLYING ERASE OSC
FE ON
W102
VA PB MODE
FE ON
H CHG
ME/MP
SYSTEM CONTROL (SS-136)
RP PB 2CH
RP PB 1CH
CH1'OUT
PB RF OUT
REC Y RF
REC C RF
REC AFM RF
REC ATF RF
RF SWP
SERVO (SS-136)
SS-136 BOARD (See page 130.)
CH1'OUT (CHECK)
PB RF
SYSTEM CONTROL
PB RF
SERVO
CN501
CN507
PB RF
V 0.2V/div H 0.1μsec/div
CN501 ⑯ PB RF OUT PB
V 0.1V/div H 0.1μsec/div
CN501 ⑮ REC Y RF REC
REC Y
REC C RF
PB RF
REC AFM RF
AUDIO
0.12Vp-p
H
CN501 ⑱ REC C RF REC
VIDEO(1) (VA-67)

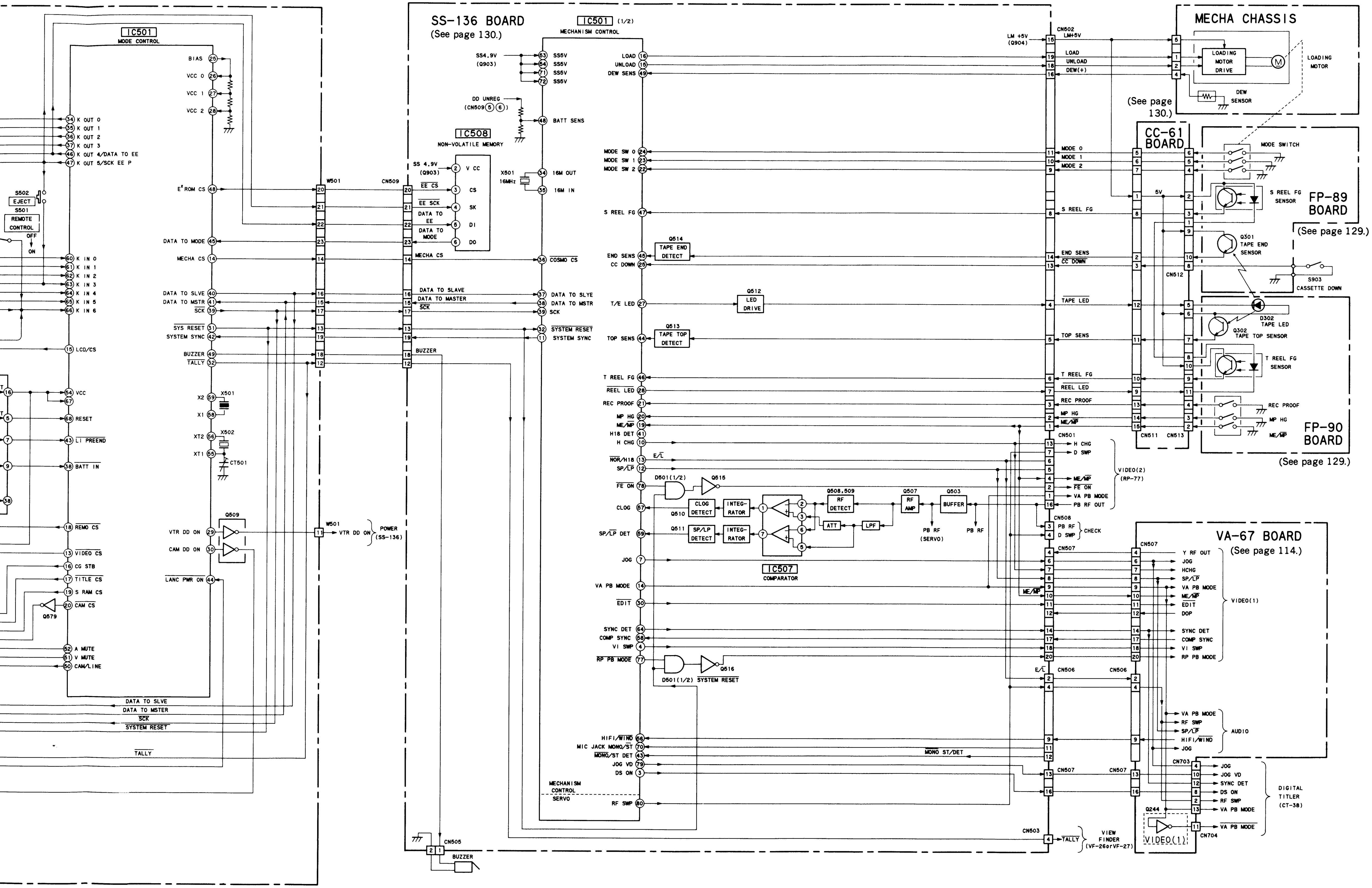
3-9. SERVO BLOCK DIAGRAM


SS-136 BOARD (SERVO) (See page 130.)
IC501 (1/2) SERVO
IC501 61 DRUM PG REC/PB
4.8Vp-p
3.2msec
IC501 60 DRUM FG REC/PB
4.8Vp-p
2V
IC501 80 RF SWP REC/PB
CN501
CN506
CN508
D SWP
VIDEO(2) (RP-77)
RF SWP
DIGITAL TITLER (CT-38)
AUDIO (VA-67)
CHECK
RF SW P
DRM BRK
DRM RVS
DRM ON
DRM ACC
DRUM D/A
CAP PWM
CAP D/A
CAP FWD/REV
CAP ON
DRUM FG
DRUM PG
CAP FG
ATF ERROR
COMP SYNC
SEL 2
SEL 1
RP PB MODE
SERVO MECHANISM CONTROL
Q516
MECHA CHASSIS
DRUM
FG
PG
CAPSTAN FG
FG(+)
FG(COM)
PG(COM)
PG(+)
CFG Vcc
CFG(B)
CFG(A)
CFG GND
W510
W505
IC502 (1/2) DRUM FG/PG AMP
LPF
WAVE SHAPER
DC BIAS (2V)
Vcc
SS4.9V (Q903)
SS 4.9V (Q903)
IC502 (1/2) CFG AMP
COMPARATOR
VIDEO(1) (VA-67)
COMP SYNC
CN507
4.8Vp-p
0.72msec
IC501 62 69 CAP FG REC/PB
2.1Vp-p
H
IC501 58 COMP SYNC REC/PB
SS4.9V
Q502 DRUM ACCEL
IC503 (1/2)
INTEGRATOR
OVER CURRENT PROTECT
2.5V
0.16V
I SENS
LPF
DRUM ERROR
CAP ERROR
IC901 (1/2) DRUM/CAPSTAN PWM DRIVE
ERROR AMP
PWM COMP
SWITCHING DRIVE
U.V. LO
SHORT CIRCUIT PROTECT
TRIANGLE OSC
RV901 DD FO
MOTOR UNREG (CN509 7 8)
Q901
Q902
SWITCHING
D901,L903
D901,L904
FLY WHEEL
DRUM VS
DRUM NFB
CAP VS
CAP FNB
IC503 (1/2) DRUM MOTOR DRIVE
MOTOR UNREG (CN509 7 8)
SS4.9V (Q903)
VCC2 VCC1
REF
OVER-HEAT PROTECT
COM
ROTER POSITION DETECT
VS
U IN
V IN
W IN
D506 DRM ON
CAP ON
STBY
START CONTROL
TIMING CONTROL
SOFT SWITING DRIVE
OUTPUT DRIVE BUFFER
OUTPUT DRIVE
U
V
W
DIR
BRAKE
DRM RVS
DRM BRK
I COM
R548-551 DRUM DRIVE CURRENT SENS
Q540
SILENCER
IC504 CAPSTAN MOTOR DRIVE
VS
CAP FWD/RVS
FRC
CAP ON
STBY
POWER OFF
120° LOGIC
SS 4.9V (Q903)
Vcc1
Vcc3
MOTOR UNREG (CN509 7 8)
Vcc2
HE POWER
UHE (+)
(-)
VHE (+)
(-)
WHE (+)
(-)
VN-
VN+
IC506 ATF SERVO
PB RF (SYSTEM CONTROL)
PB RF BUFFER Q503
LPF
PRE AMP
GAIN CONT
GCA
BALANCED MODULATOR
3fH BPF
fH BPF
PEAK DET
SAMPLING HOLD
SCHMITT
V REF
AMP
ATF ERROR
CH1/CH2
TS B
TS A
RP PB MODE
REC ATF LPF
REC ATF
SEL1
SEL2
SS 4.9V (Q903)
A Vcc
D Vcc
OSC
X502 5.86MHz
5.86MHz
3Vp-p
IC506 14 OSC IN REC/PB
VIDEO(2) BLOCK
VIDEO HEAD
CH1
CH2
CH1(X)
CH2(X)
IC101
REC/PB AMP
W101
W102
RP-77 BOARD
(See page 130.)
CN501
PB ATF OUT
REC ATF RF
PB RF (VIDEO AUDIO)
V: 0.2V/div
H: 0.1μsec/div
CN501 16 PB RF OUT PB


503 (1/2)
MOTOR
IVE
DRUM VS
W510
DRM COM
COM
VS
ROTER POSITION DETECT
U IN
V IN
W IN
LPF
LPF
LPF
NG
ROL
SOFT SWITING DRIVE
OUTPUT DRIVE BUFFER
OUTPUT DRIVE
U
V
W
DRM U
DRM V
DRM W
MECHA CHASSIS
DRUM MOTOR
I COM
Q540
SILENCER
R548-551
DRUM DRIVE
CURRENT SENS
IC504
CAPSTAN MOTOR DRIVE
120° LOGIC
W505
CAP U
CAP V
CAP W
CAPSTAN MOTOR
HE POWER
HE Vcc
VN-
VN+
WHE
(-)
(+)
(-)
UHE(+),(-)
VHE(+),(-)
WHE(+),(-)
HE GND
HALL DEVICE

3-10. SYSTEM CONTROL BLOCK DIAGRAM


ED-32 BOARD
(See page 136.)
S920 EDIT
S921 EDIT
D920 TALLY
TALLY
DK-15 BOARD
(See page 135.)
S950 TITLE
S951 AUTO
S952 COLOR
S953 MEMORY
ZK-14 BOARD
(See page 136.)
S680 MACRO
S681 FADER
CK-50 BOARD (See page 136.)
S670 AUTO LOCK
S671 SHUTTER
S672 AE
S673 AUTO FOCUS ON/OFF
S674 ONE PUSH AUTO FOCUS
S675 BACK LIGHT
S676 AUTO WHITE BALANCE
LCD
IC670 LCD DRIVE
LI-39 BOARD
(See page 136.)
LITHIUM BATTERY
RM-50 BOARD
(See page 136.)
IC960 REMOTE CONTROL RECEIVER
IC950 SIRCS CONTROL
X950 700kHz
VK-14 BOARD (See page 134.)
S521 BEEP
S510; E Model only.
S508 DS
S512 FRAME
S510 REC
S516 RESET
S505 PAUSE
S509 EVENT
S507 DATE
S506 TIME
S515 ZERO MEM
S520 PB
S513 SLOW
S503 FF
S504 STOP
S500 REW
S514 POWER
VTR
OFF
CAMERA
S511 EDIT, SP/LP
S502 EJECT
S501 REMOTE CONTROL
IC501 MODE CONTROL
IC503 EVER 5V REG
IC504
EVER DC REG
RESET
PRE-END DET
EVER 5V DET
DD UNREG (PS991)
EVER 5V
EVER DC
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K OUT 4/DATA TO EE
K OUT 5/SCK EE P
K IN 0
K IN 1
K IN 2
K IN 3
K IN 4
K IN 5
K IN 6
LCD CS
LI(+)
TALLY
SIRCS
DATA TO SLVE
DATA TO MASTER
SCK
REMO CS
SYSTEM RESET
VCC
RESET
LI PREEND
BATT IN
VIDEO CS
CG STB
TITLE CS
S RAM CS
CAM CS
A MUTE
V MUTE
CAM/LINE
BIAS
VCC 0
VCC 1
VCC 2
E²ROM CS
DATA TO MODE
MECHA CS
DATA TO SLVE
DATA TO MSTR
SYS RESET
SYSTEM SYNC
BUZZER
X2
X1
XT2
XT1
VTR DD ON
CAM DD ON
LANC PWR ON
VA-67 BOARD
(See page 114.)
CAMERA(2) (VC-99)
CAM CS
SYS RESET
LANC TO CAM
CAM TO LANC
DIGITAL TITLER (CT-38)
EVER DC
VIDEO(1)
AUDIO
SP CS
IC1 LANC I/O
DATA OUT
DATA IN
LANC OUT
LANC DC
WAKE UP
P CONT
UNREG
(CN508 ⑬)
(CN506 ⑤)
Q247
Q246
Q245
Q579
Q950
Q900,901
WAKE UP
CAM DD ON
POWER CAMERA DC-DC CONVERTER
SW-183 BOARD
(See page 146.)
J901 REMOTE
SWITCH
S901 START/STOP
S900 STANDBY
OFF
ON
LANC
MC-76 BOARD
(See page 145.)
S651 START/STOP
FU-100 BOARD (See page 139.)


IC501
MODE CONTROL
BIAS
VCC 0
VCC 1
VCC 2
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K OUT 4/DATA TO EE
K OUT 5/SCK EE P
S502 EJECT
S501 REMOTE CONTROL
OFF
ON
E²ROM CS
DATA TO MODE
MECHA CS
K IN 0
K IN 1
K IN 2
K IN 3
K IN 4
K IN 5
K IN 6
DATA TO SLVE
DATA TO MSTR
SCK
SYS RESET
SYSTEM SYNC
BUZZER
TALLY
LCD/CS
VCC
RESET
LI PREEND
BATT IN
X2
X1
X501
XT2
XT1
X502
CT501
REMO CS
VIDEO CS
CG STB
TITLE CS
S RAM CS
CAM CS
Q579
A MUTE
V MUTE
CAM/LINE
Q509
VTR DD ON
CAM DD ON
LANC PWR ON
W501
CN509
VTR DD ON
POWER (SS-136)
DATA TO SLVE
DATA TO MSTER
SCK
SYSTEM RESET
TALLY
SS-136 BOARD
(See page 130.)
IC501 (1/2)
MECHANISM CONTROL
SS4.9V (Q903)
SS5V
DD UNREG (CN509⑤⑥)
BATT SENS
IC508
NON-VOLATILE MEMORY
SS 4.9V (Q903)
V CC
CS
SK
DI
DO
EE CS
EE SK
DATA TO EE
DATA TO MODE
X501 16MHz
16M OUT
16M IN
MECHA CS
COSMO CS
DATA TO SLAVE
DATA TO MASTER
SCK
DATA TO SLVE
DATA TO MSTR
SYSTEM RESET
SYSTEM SYNC
BUZZER
LOAD
UNLOAD
DEW SENS
MODE SW 0
MODE SW 1
MODE SW 2
S REEL FG
Q514 TAPE END DETECT
END SENS
CC DOWN
Q512 LED DRIVE
T/E LED
Q513 TAPE TOP DETECT
TOP SENS
T REEL FG
REEL LED
REC PROOF
MP HG
ME/MP
H18 DET
H CHG
E/L
NOR/H18
SP/LP
D501(1/2)
Q515
FE ON
CLOG
Q510 CLOG DETECT
INTEG-RATOR
Q508,509 RF DETECT
Q507 RF AMP
Q503 BUFFER
ATT
LPF
PB RF (SERVO)
PB RF
SP/LP DET
Q511 SP/LP DETECT
IC507 COMPARATOR
JOG
VA PB MODE
EDIT
SYNC DET
COMP SYNC
VI SWP
RP PB MODE
D501(1/2) SYSTEM RESET
Q516
HIFI/WIND
MIC JACK MONO/ST
MONO/ST DET
JOG VD
DS ON
MECHANISM CONTROL
SERVO
RF SWP
MONO ST/DET
CN505
BUZZER
LM +5V (Q904)
CN502
LM+5V
LOAD
UNLOAD
DEW(+)
MODE 0
MODE 1
MODE 2
S REEL FG
END SENS
CC DOWN
TAPE LED
TOP SENS
T REEL FG
REEL LED
REC PROOF
MP HG
ME/MP
CN501
H CHG
D SWP
ME/MP
FE ON
VA PB MODE
PB RF OUT
VIDEO(2) (RP-77)
CN508
PB RF
D SWP
CHECK
CN507
E/L
CN506
CN503
TALLY
VIEW FINDER (VF-26orVF-27)
MECHA CHASSIS
LOADING MOTOR DRIVE
M
LOADING MOTOR
DEW SENSOR
(See page 130.)
CC-61 BOARD
5V
CN512
CN511
CN513
MODE SWITCH
S REEL FG SENSOR
FP-89 BOARD
(See page 129.)
Q301 TAPE END SENSOR
S903 CASSETTE DOWN
D302 TAPE LED
Q302 TAPE TOP SENSOR
T REEL FG SENSOR
REC PROOF
MP HG
ME/MP
FP-90 BOARD
(See page 129.)
VA-67 BOARD
(See page 114.)
CN507
Y RF OUT
JOG
HCHG
SP/LP
VA PB MODE
ME/MP
EDIT
DOP
SYNC DET
COMP SYNC
VI SWP
RP PB MODE
VIDEO(1)
CN506
VA PB MODE
RF SWP
SP/LP
HIFI/WIND
JOG
AUDIO
CN703
JOG
JOG VD
SYNC DET
DS ON
RF SWP
VA PB MODE
VA PB MODE
DIGITAL TITLER (CT-38)
Q244
VIDEO(1)
CN704

3-11. SERVO, SYSTEM CONTROL SYSTEM TERMINAL FUNCTION SS-136 BOARD IC501 (CXP-80116)

PIN No.	Signal Name	I/O	Function	Connection
1	SEL2	O	ATF REF PILOT signal frequency control ATF REF PILOT f_1 f_2 f_3 f_4 SEL 1 H L H L SEL 2 H H L L	ATF IC CXA1204Q
2	SEL1	O		
3	DS ON	O	Data Screen ON/OFF control Data Screen On and Data Screen key are selected with "H"	VIDEO block
4	VI SWP	O	RF SWP using for Vidoe system Normally, same as RF SWP. When using 'CH only "H" 3Head is used.	VIDEO block
5	DRM ACC	O	DRUM motor acceleration signal Acceleration is selected with "H"	To Drum motor driver CXA8006M
6	DRM BLK	O	DRUM motor brake signal Brake is selected with "H"	To Drum motor driver CXA8006M
7	JOG	O	Normal/JOG mode recognition signal JOG is selected with "H"	R/P Amp VIDEO block
8	FE RA	—	Not used	——
9	FE RS	—		
10	H CHG	O	2CH or 'CH select signal 'CH is selected with "H" Only 3Head is used	VIDEO system R/P Amp
11	SYSTEM SYNC	O	Internal bus communication synchronizing signal (V synchronization)	Mode controller
12	SP/$\overline{\text{LP}}$	O	SP/LP mode recognition signal SP mode is selected with "H"	R/P Amp VIDEO/AUDIO block
13	$\overline{\text{NOR}}$/Hi8	O	Not used Normally, "L"	——
14	VA PB MODE	O	VIDEO/AUDIO system REC/PB mode select PB mode is selected with "H"	VIDEO/AUDIO block
15	UNLOAD	O	Loading motor control signal OFF LOADING UNLOADING BRAKE LOAD L H L H UNLOAD L L H H	To loading motor
16	LOAD	O		
17	CAP ON2	—	Not used	——
18	AF REC	—	Not used	——
19	ME/$\overline{\text{MP}}$	I	ME/MP tape recognition input ME tape is selected with "H"	To CC board
20	MP HG	I	MP HG tape recognition input MPHG is selected with "L"	To CC board
21	REC PROOF	I	REC PROOF recognition input REC PROOF is selected with "L"	To CC board
22	MODE SW2	I	} Mechanical position input	To CC board
23	MODE SW1	I		
24	MODE SW0	I		
25	$\overline{\text{CC DOWN}}$	I	Cassette IN switch input Cassette IN is selected with "L"	To CC board
26	DRM ON	O	Drum motor drive control Motor Drive is selected with "H"	To Drum motor driver CXA8006M
27	T/E LED	O	LED for tape top end sensor drive control LED Flashing is selected with "H"	To CC board
28	$\overline{\text{REEL LED}}$	O	LED for reel sensor drive control LED Flashing is selected with "L"	To CC board

PIN No.	Signal Name	I/O	Function	Connection
29		—	Not used	——
30	$\overline{\text{EDIT}}$	O	EDIT ON/OFF control EDIT is selected with "L"and interlocked with EDIT key.	To VIDEO block
31	SS GND	—	—	——
32	$\overline{\text{SYSTEM}}$ $\overline{\text{RESET}}$	I	Control by mode controller with RESET terminal of this microcomputer RESET is selected "L"	Mode controller and others
33	SS GND	—	—	——
34	16M OUT	O	Crystal connecting terminal for system clock oscillation (16 MHz)	X'tal (X501)
35	16M IN	I		
36	$\overline{\text{COSMO CS}}$	I	Select signal of this microcomputer from internal bus communication mode controller Selected with "L"	Mode controller
37	DATA TO SLVE	I	Serial data input terminal	Mode controller
38	DATA TO MSTR	O	Serial data output terminal	Mode controller
39	$\overline{\text{SCK}}$	I	Serial clock input terminal	Mode controller
40	PCM ACT	—	Not used	——
41	Hi8 DET	—	Not used Normally, "L"	——
42	S IN	—	Not used Normally, "H"	——
43	$\overline{\text{MONO}}$/ST DET	I	AFM monaural/stereo recognition input Stereo is selected "H" (Only stereo correspondence model)	To AUDIO block
44	TOP SENS	I	Tape top end sensor input TOP is selected with "H"	To CC board
45	END SENS	I	END is selected with "H"	
46	T REEL FG	I	Reel sensor input Take up side	To CC board
47	S REEL FG	I	Reel sensor input Supply side	
48	BATT SENS	I	Battery input voltage sense	——
49	DEW SENS	I	DEW SENSOR input	DEW SENSOR
50	THERMISTOR	I	THERMISTOR input (This model : fixed value)	
51	ATF ERROR	I	ATF errer (ATF LOCK error) input, A/D input terminal	IC506⑫
52	SS GND	—	—	——
53 54	SS 4.9V		Power source supply terminal	
55	DRM PG	I	DRUM PG input, FRC (high precision timer) capture input terminal	IC502 ⑨
56	$\overline{\text{HiFi}}$/WIND	I	MIC HiFi/WIND input. HiFi is selected with "L", WIND is selected with "H"	To AUDIO block
57	CLOG	I	Clog detection signal input. CLOG is selected with "H"	Q510 ©
58	COMP SYNC	I	Composite trunk (composite synchronizing signal) input. (built-inV SYNC separator)	To VIDEO block
59	SP/$\overline{\text{LP}}$ DET	I	SP/LP recognition signal input	Q511 ©

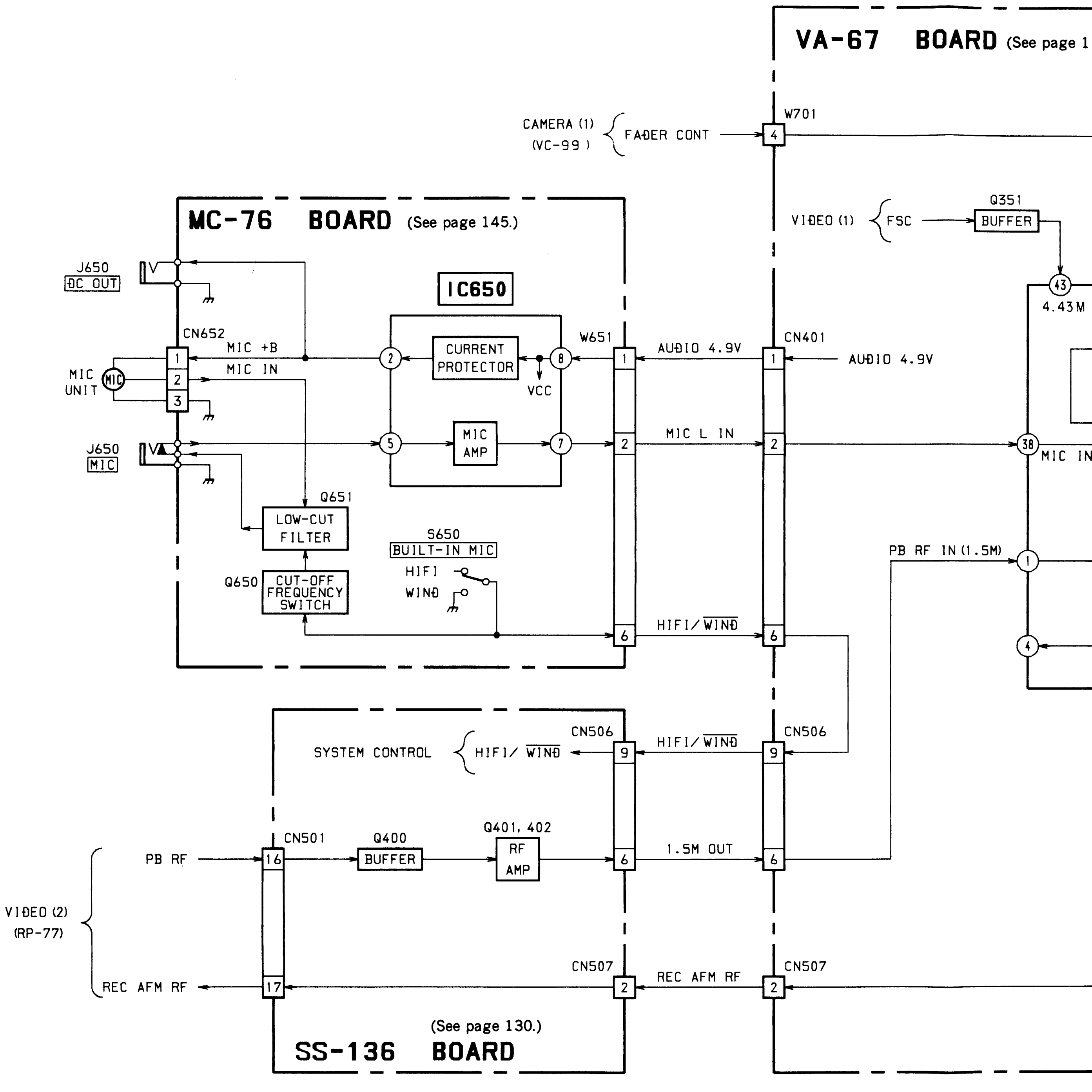
PIN No.	Signal Name	I/O	Function	Connection
60	DRM PG	—	—	—
61	DRM FG	I	DRUM FG input terminal, FRC capture input terminal	IC502 ⑩ Sense Amplifier
62	CAP FG	I	CAPSTAN FG input terminal, FRC capture input terminal	IC502⑫ Sense amplifier
63	MONO/$\overline{\text{ST}}$	—	Not used	—
64	SYNC DET	I	With/Without VIDEO signal recognition signal input	To VIDEO block
65	CAP D/A	O	DA gate pulse output terminal for CAP ERROR output, Servo exclusive output terminal (DA mode)	To capstan lowpass filter
66	DRM D/A	O	DA gate pulse output terminal for DRUM ERROR output, Servo exclusive output terminal (DA mode)	To drum lowpass filter
67	CAP PWM	O	PWM output terminal for CAP ERROR output, Servo excluseive output terminal (PWM mode)	Capstan driver IC503
68	DRM RVS	O	DRUM rotating direction control signal RVS is selected with "H" FWD is selected with "L"	IC503 ③
69	CAP FG	I	External event input terminal to CAP FG input terminal exclusive counter for TAPE COUNTER drive	IC502⑫ sense amplifier
70	MIC JACK MONO/$\overline{\text{ST}}$	I	External MIC Monaural/stereo recognition signal. Monaural is selected with "H"	To AUDIO block
71 72	SS 4.9V			
73	SS GND	—	—	—
74	—	—	Not used	—
75	CAP ON	O	Capstan driver ON control signal	IC504⑬ Capstan driver
76	CAP FWD/$\overline{\text{REV}}$	O	Capstan rotaing direction control signal, FWD is selected with "H", RVS is selected with "L"	IC504⑳ Capstan driver
77	$\overline{\text{RP PB MODE}}$	O	REC/PB mode select signal of RP amplifier and ATF IC	Q516 Ⓑ
78	FE ON	O	Flying erase oscillatio ON/OFF signal. Oscillation is selected with "H"	To RP AMP.
79	JOG VD	O	Artificial VD output terminal input to VIDEO signal in varying speed playback	To VIDEO block
80	RF SWP	O	RF SWP output temrinal	RP block VIDEO/AUDIO block

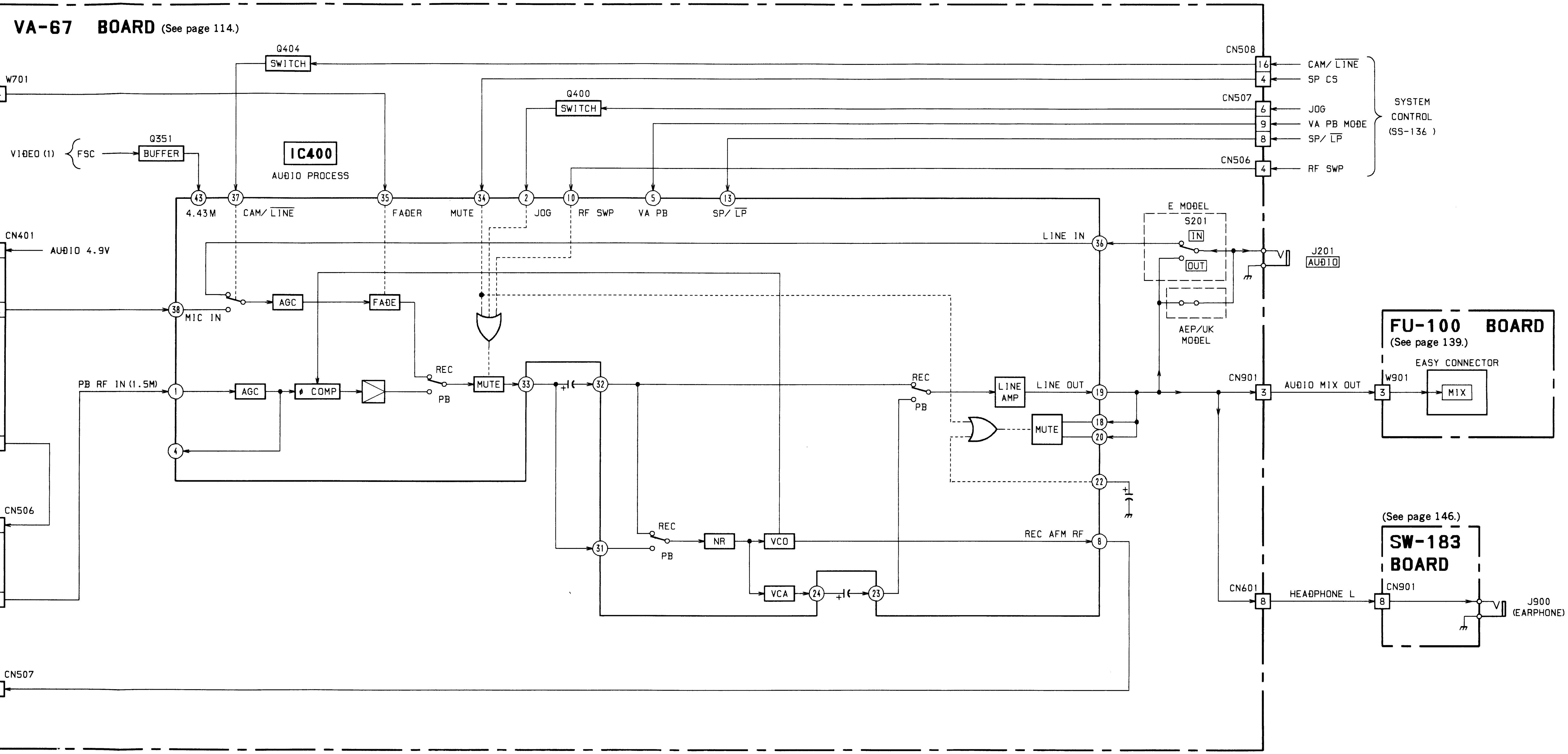
3-12. MODE CONTROL SYSTEM IC TERMINAL FUNCTION DESCRIPTION FU-100 BOARD IC501 (μPD75316)

PIN No.	Port Name	Function		I/O	Connection	Signal Name
1	S12	Segment signal output	Segment terminal drive to LCD. Not used.	O		
2	S13	Output (Four value output of 0, 1.7, 3.3, 5V)		O		
3	S14	Output (Four value output of 0, 1.7, 3.3, 5V)		O		
4	S15	Output (Four value output of 0, 1.7, 3.3, 5V)		O		
5	S16	Output (Four value output of 0, 1.7, 3.3, 5V)		O		
6	S17	Output (Four value output of 0, 1.7, 3.3, 5V)		O		
7	S18	Output (Four value output of 0, 1.7, 3.3, 5V)		O		
8	S19	Output (Four value output of 0, 1.7, 3.3, 5V)		O		
9	S20	Not used		O		
10	S21	Not used		O		
11	S22	Not used		O		
12	S23	Not used		O		
13	S24/BP0	Chip select signal to video IC (CXA1207) 1V period "L" pulse		O	VA	$\overline{\text{VIDEO CS}}$
14	S25/BP1	Chip select signal to SS board IC501 (CXP80116) 1V period "L" pulse		O	SS IC501	$\overline{\text{MECHA CS}}$
15	S26/BP2	Chip select signal to LCD driver (M34206) 1V period "L" pulse		O	CK	$\overline{\text{LCD CS}}$
16	S27/BP3	Strobe signal for character generator (μPD6451) 1V "H" pulse train.		O	VA	CG STB
17	S28/BP4	Chip select to titler (CF79028) 1V "L" pulse		O		$\overline{\text{TITLE CS}}$
18	S29/BP5	Chip select to sercs remote control (μPD7564) 1V "L" pulse		O	DK	$\overline{\text{REMO CS}}$ REMOTE CONTROL
19	S30/BP6	Chip select to SRAM "H" when using title, Normally, "L"		O		S RAM CS
20	S31/BP7	Chip select to camera μCOM 1V period "H" pulse		O	CAMERA	CAM CS
21	COM0	LCD to common signal output Common terminal drive output Not used.		O		
22	COM1			O		
23	COM2			O		
24	COM3			O		
25	BIAS	Output terminal for outside dividing resistance cut, Power input. Not used.		O		
26	VLC0	Power source for LCD drive, 3V in backup Not used.	Power source 0 input terminal	I		
27	VLC1		Power source 1 input terminal	I		
28	VLC2		Power source 2 input terminal	I		
29	P40	SS 5V,VTR 5V power source detection, "H" when VTR power source is turned on.		O	VA	VTR DD ON
30	P41	CAM 5V power source detection		O	CAMERA	$\overline{\text{CAM DD ON}}$
31	P42	Output port to reset each IC when power is turned on.		O	all	$\overline{\text{SYS RESET}}$
32	P43	External tally and internal tally drive port		O	VA and DK	$\overline{\text{TALLY}}$
33	V_{ss}	GND				V_{ss}
34	P50	L active KEY matrix output port		O	all	K OUT0
35	P51			O	all	K OUT1
36	P52			O	all	K OUT2
37	P53			O	all	K OUT3
38	P00/INT4	Clock select to 32K with "L" and to 4.19M with "H" when Battery is turned on, "L" is select.		I	FU	$\overline{\text{BATT IN}}$

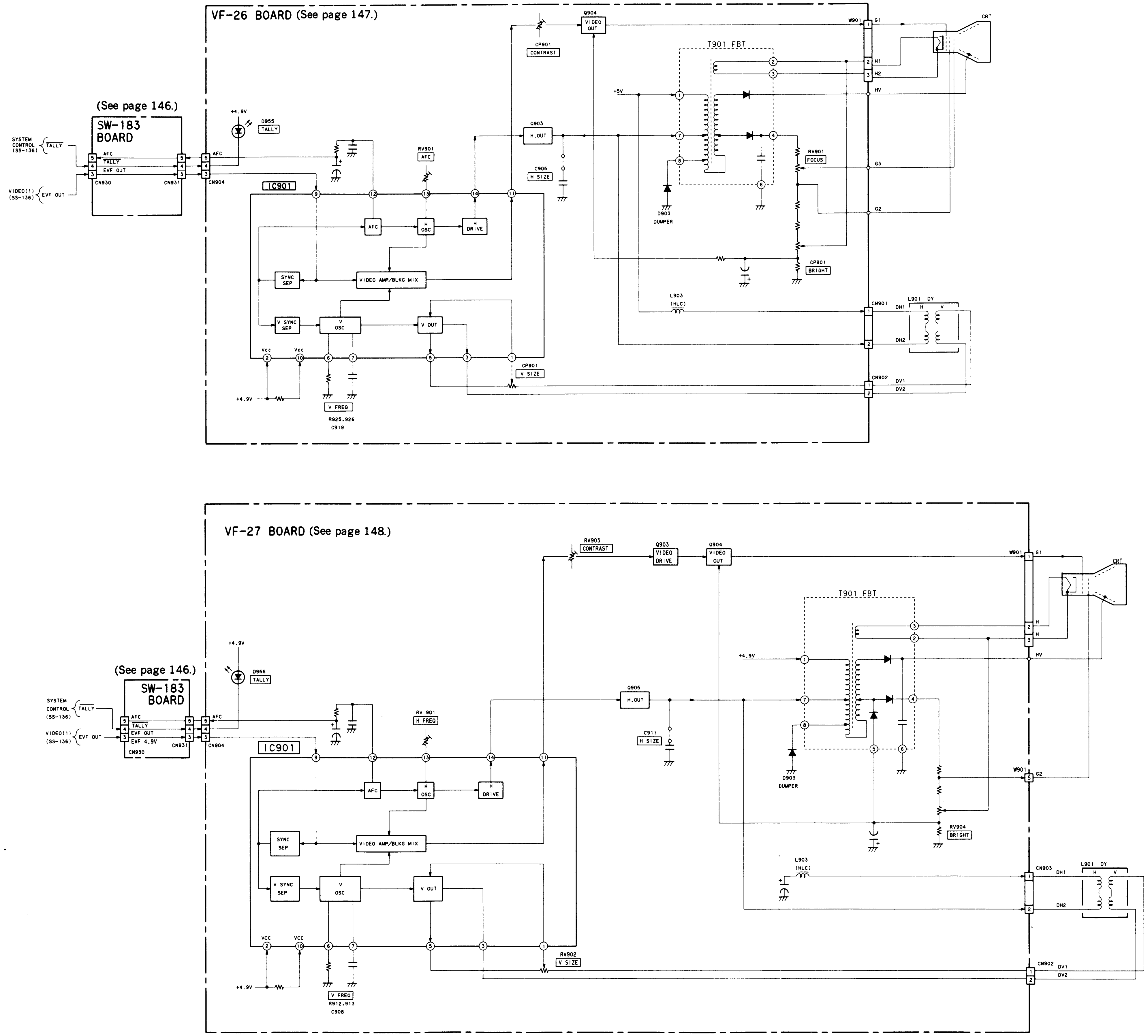
PIN No.	Port Name	Function	I/O	Connection	Signal name
39	P01/$\overline{\text{SCK}}$	Serial clock input-output terminal, Serial clock (2μS) communication	O	all	$\overline{\text{SCK}}$
40	P02/SO/SB0	Serial clock input-output terminal, Serial clock (2μS) communication	O	all	DATA TO SLVE
41	P03/SI/SB1	Serial bus input terminal, Serial clock (2μS) communication	I	all	DATA TO MASTR
42	P10/INT0	(Edge detection vector interruption), System synchronization input port from CXD80116	I	SS IC501	SYSTEM SYNC
43	P11/INT1	(Edge detection vector interruption), Lithium PRE END is selected wiht "L"	I	FU	$\overline{\text{LI PRE END}}$
44	P12/INT2	STABY release input, Release wiht "L" , STA	I	VA	$\overline{\text{LANC PWR ON}}$
45	P13/TIO	E²PROM serial communication data input, EE PROM communiaction KEY matrix OUT is combined.	I	SS IC508	DATA TO MODE
46	P20/PT00	E²PROM serial communication date output, EE PROM communication KEY matrix OUT is combined.	O	SS IC508	KOUT4/DATA TO EE
47	P21	E²PROM serial communication clock output key matrix output, EE PROM communication KEY matrix OUT is combined.	O	SS IC508 VK	KOUT5/SCK EE
48	P22/PCL	Chip select to E²PROM	O	SS IC508	$\overline{\text{EEPROM CS}}$
49	P23/BUZ	Buzzer out	O	SS	BUZZER
50	P30/LCDCL	CAMERA/LINE select output, Camera mode is selected wiht "H", VTR is selected with "L"	O	VA	CAM/$\overline{\text{LINE}}$
51	P31/SYNC	Video mute signal output terminal	O	VA	V MUTE
52	P32	Audio mute signal output terminal	O	VA	A MUTE
53	P33	Chip select to serial/parallel IC. Not used.	O		SP CS
54	V_{DD}	V_E 3V/5V power source terminal		FU	V_{DD}
55	XT1	Sub system clock 32K oscillation terminal	I	FU	XT1
56	XT2			FU	XT2
57	NC			—	NC
58	X1	Main system clock 4.19M oscillation terminal	I	FU	X1
59	X2		I	FU	X2
60	P60/KK0	KEY matrix input terminal 18msec period normally "H" Input-Output is possible by bit. Pull-up from software is possible by 4-bit.	I	all	K IN 0
61	P61/KR1		I	all	K IN 1
62	P62/KR2		I	all	K IN 2
63	P63/KR3		I	all	K IN 3
64	P70/KR4	KEY matrix input terminal. 18msec period normally "H" 4-bit input-Output port. Pull-up from software is possible by 4-bit.	I	all	K IN 4
65	P71/KR5		I	all	K IN 5
66	P72/KR6		I	all	K IN 6
67	P73/KR7		I	all	K IN 7
68	$\overline{\text{RESET}}$	System reset input, Reset input terminal of microcomputer	I		$\overline{\text{RESET}}$
69	S0	Segment signal output terminal not used.	O		
70	S1		O		
71	S2		O		
72	S3		O		
73	S4		O		
74	S5		O		
75	S6	LCD segment signal output terminal. (Four value output of 0, 1.7, 3.3, 5V). Not used.	O		
76	S7		O		
77	S8		O		
78	S9		O		
79	S10		O		
80	S11		O		

3-13. AUDIO BLOCK DIAGRAM

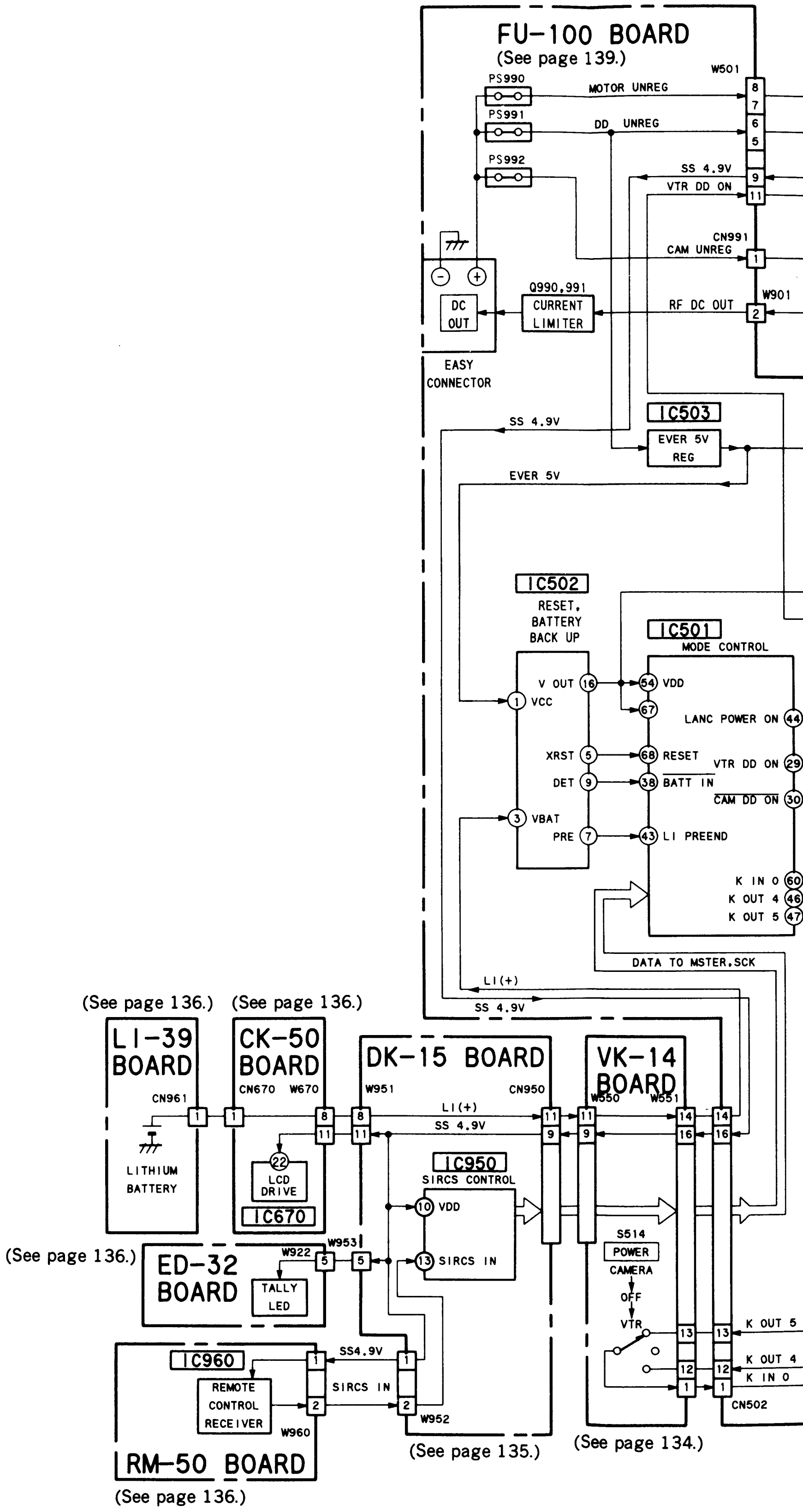

VA-67 BOARD (See page 1
CAMERA (1) (VC-99)
FADER CONT
W701
VIDEO (1)
FSC
Q351
BUFFER
4.43M
MC-76 BOARD (See page 145.)
J650 DC OUT
IC650
CN652
MIC +B
MIC IN
MIC UNIT
MIC
CURRENT PROTECTOR
VCC
W651
AUDIO 4.9V
CN401
AUDIO 4.9V
MIC AMP
MIC L IN
J650 MIC
MIC IN
Q651
LOW-CUT FILTER
S650 BUILT-IN MIC
HIFI
WIND
Q650
CUT-OFF FREQUENCY SWITCH
PB RF IN (1.5M)
HIFI/WIND
CN506
SYSTEM CONTROL
HIFI/WIND
CN506
HIFI/WIND
CN501
Q400
Q401, 402
PB RF
BUFFER
RF AMP
1.5M OUT
VIDEO (2) (RP-77)
CN507
REC AFM RF
CN507
REC AFM RF
(See page 130.)
SS-136 BOARD

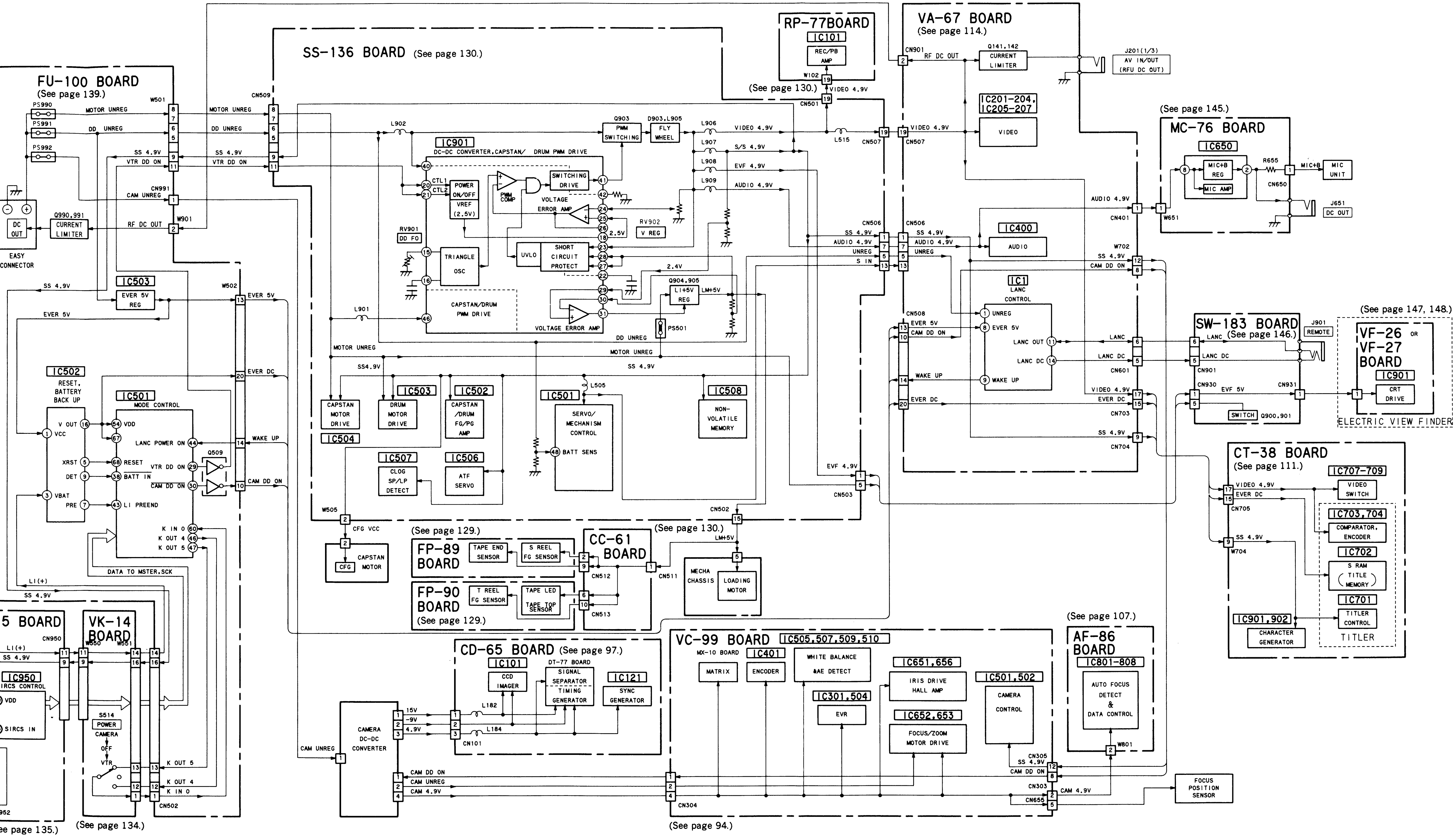

VA-67 BOARD (See page 114.)
W701
VIDEO (1)
FSC
Q351
BUFFER
Q404
SWITCH
Q400
SWITCH
IC400
AUDIO PROCESS
43
4.43M
37
CAM/ LINE
35
FADER
34
MUTE
2
JOG
10
RF SWP
5
VA PB
13
SP/ LP
CN401
AUDIO 4.9V
38
MIC IN
AGC
FADE
REC
PB
MUTE
33
32
PB RF IN (1.5M)
1
AGC
ϕ COMP
4
CN506
31
REC
PB
NR
VCO
VCA
24
23
REC AFM RF
8
CN507
CN508
16
4
CAM/ LINE
SP CS
CN507
6
9
8
JOG
VA PB MODE
SP/ LP
CN506
4
RF SWP
SYSTEM CONTROL (SS-136)
E MODEL
S201
IN
OUT
AEP/UK MODEL
J201
AUDIO
LINE IN
36
REC
PB
LINE AMP
LINE OUT
19
MUTE
18
20
22
CN901
3
AUDIO MIX OUT
FU-100 BOARD
(See page 139.)
EASY CONNECTOR
W901
3
MIX
(See page 146.)
SW-183 BOARD
CN601
8
HEADPHONE L
CN901
8
J900 (EARPHONE)

3-14. VIEWFINDER BLOCK DIAGRAM


VF-26 BOARD (See page 147.)
(See page 146.)
SW-183 BOARD
SYSTEM CONTROL (SS-136) TALLY
VIDEO(1) (SS-136) EVF OUT
AFC
TALLY
EVF OUT
CN930
CN931
CN904
D955 TALLY
+4.9V
IC901
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
Vcc
RV901 AFC
Q903 H.OUT
C905 H SIZE
Q904 VIDEO OUT
CP901 CONTRAST
T901 FBT
+5V
D903 DUMPER
RV901 FOCUS
CP901 BRIGHT
L903 (HLC)
CP901 V SIZE
V FREQ
R925,926 C919
W901
G1
H1
H2
HV
G3
G2
CRT
CN901
DH1
DH2
L901 DY
H
V
CN902
DV1
DV2
VF-27 BOARD (See page 148.)
(See page 146.)
SW-183 BOARD
EVF 4.9V
RV903 CONTRAST
Q903 VIDEO DRIVE
Q904 VIDEO OUT
RV 901 H FREQ
Q905 H.OUT
C911 H SIZE
+4.9V
RV904 BRIGHT
RV902 V SIZE
R912,913 C908
CN903

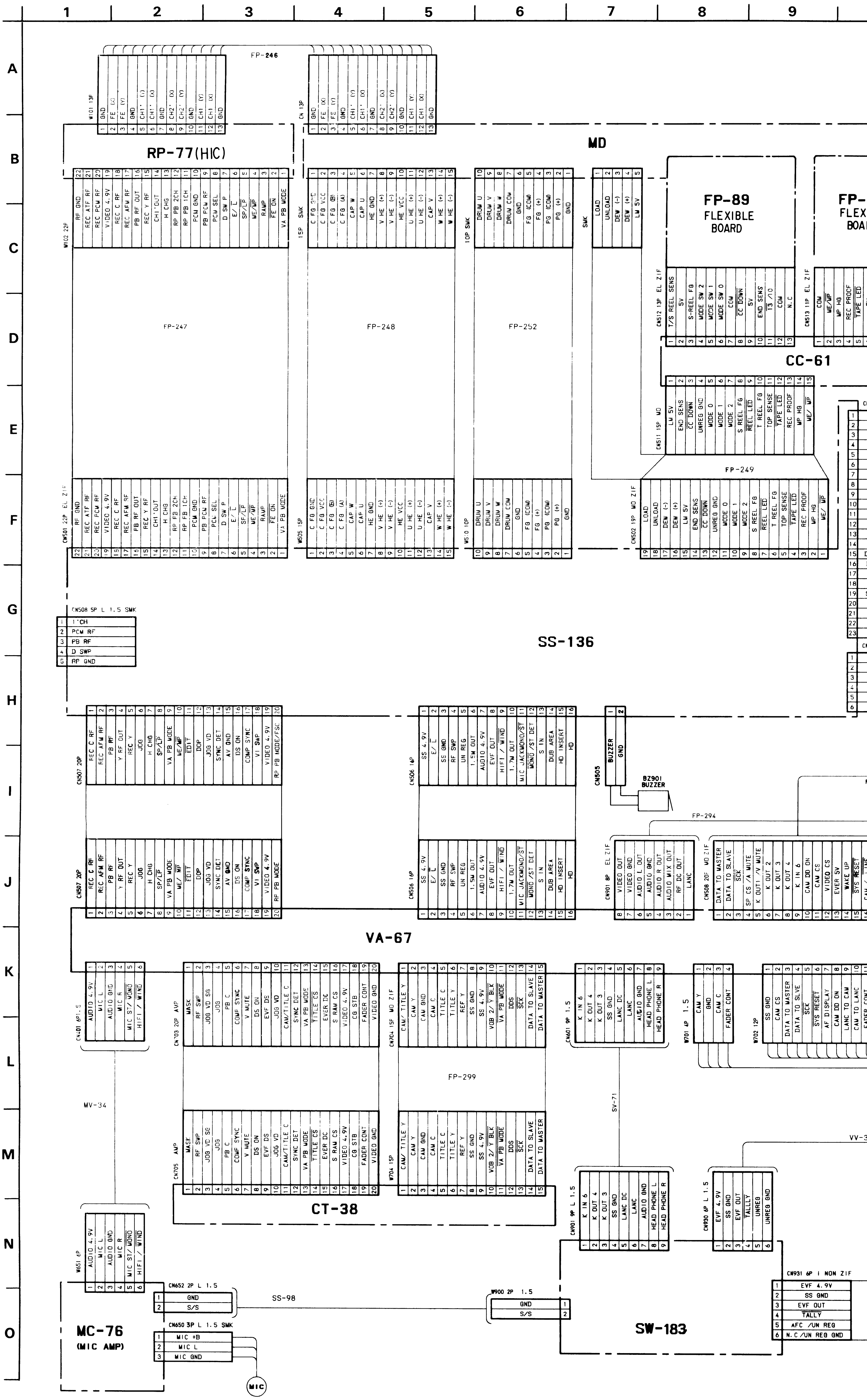
3-15. POWER BLOCK DIAGRAM

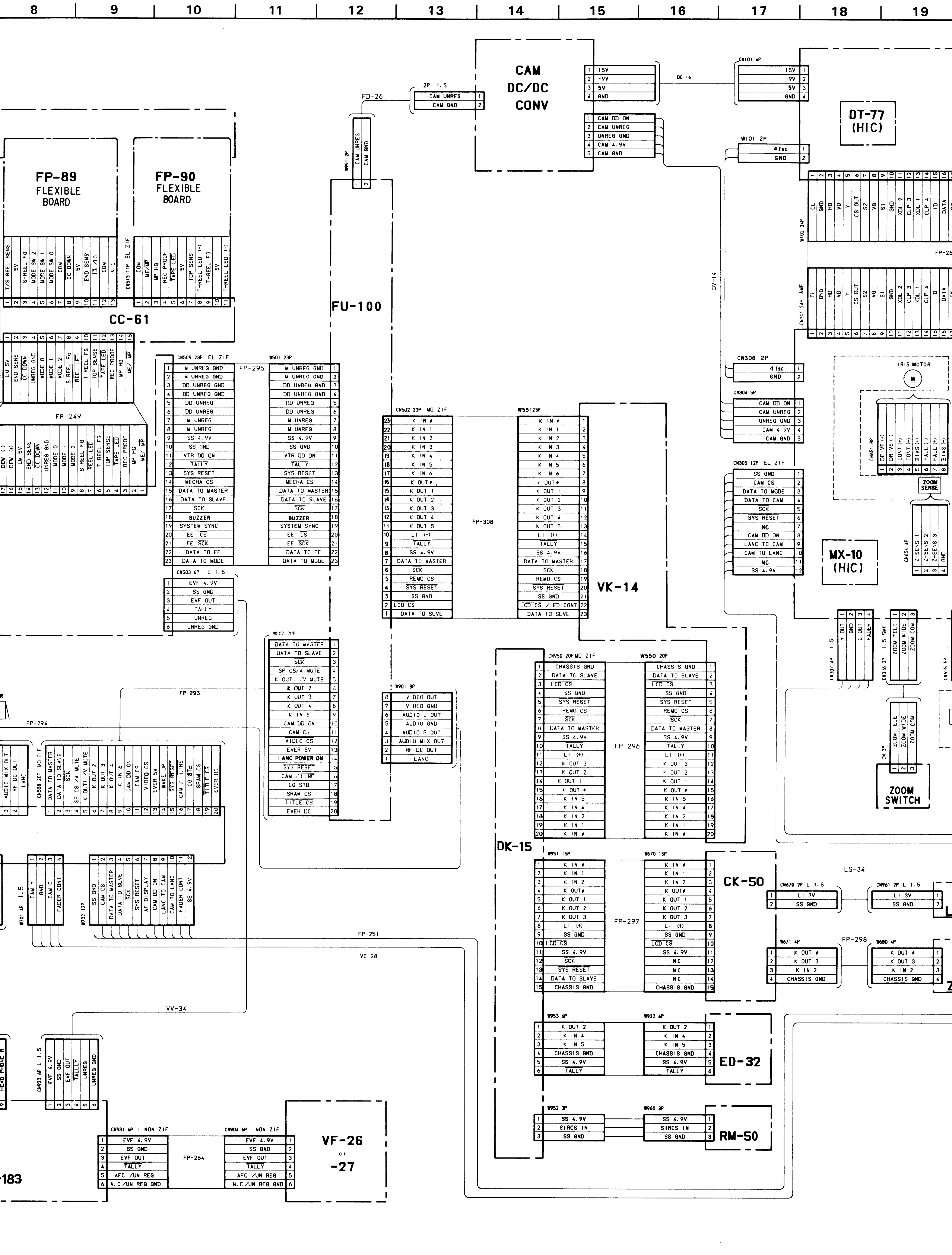

FU-100 BOARD
(See page 139.)
W501
PS990
PS991
PS992
MOTOR UNREG
DD UNREG
SS 4.9V
VTR DD ON
CN991
CAM UNREG
DC OUT
EASY CONNECTOR
Q990,991 CURRENT LIMITER
RF DC OUT
W901
IC503
EVER 5V REG
SS 4.9V
EVER 5V
IC502
RESET, BATTERY BACK UP
V OUT
VCC
XRST
DET
VBAT
PRE
IC501
MODE CONTROL
VDD
LANC POWER ON
RESET
VTR DD ON
BATT IN
CAM DD ON
LI PREEND
K IN 0
K OUT 4
K OUT 5
DATA TO MSTER,SCK
LI(+)
SS 4.9V
(See page 136.)
LI-39 BOARD
CN961
LITHIUM BATTERY
(See page 136.)
CK-50 BOARD
CN670 W670
IC670
LCD DRIVE
DK-15 BOARD
W951
CN950
IC950
SIRCS CONTROL
VDD
SIRCS IN
VK-14 BOARD
W550
W551
(See page 136.)
ED-32 BOARD
W922
TALLY LED
W953
IC960
REMOTE CONTROL RECEIVER
W960
RM-50 BOARD
(See page 136.)
SS4.9V
SIRCS IN
W952
(See page 135.)
S514 POWER
CAMERA
OFF
VTR
K OUT 5
K OUT 4
K IN 0
CN502
(See page 134.)

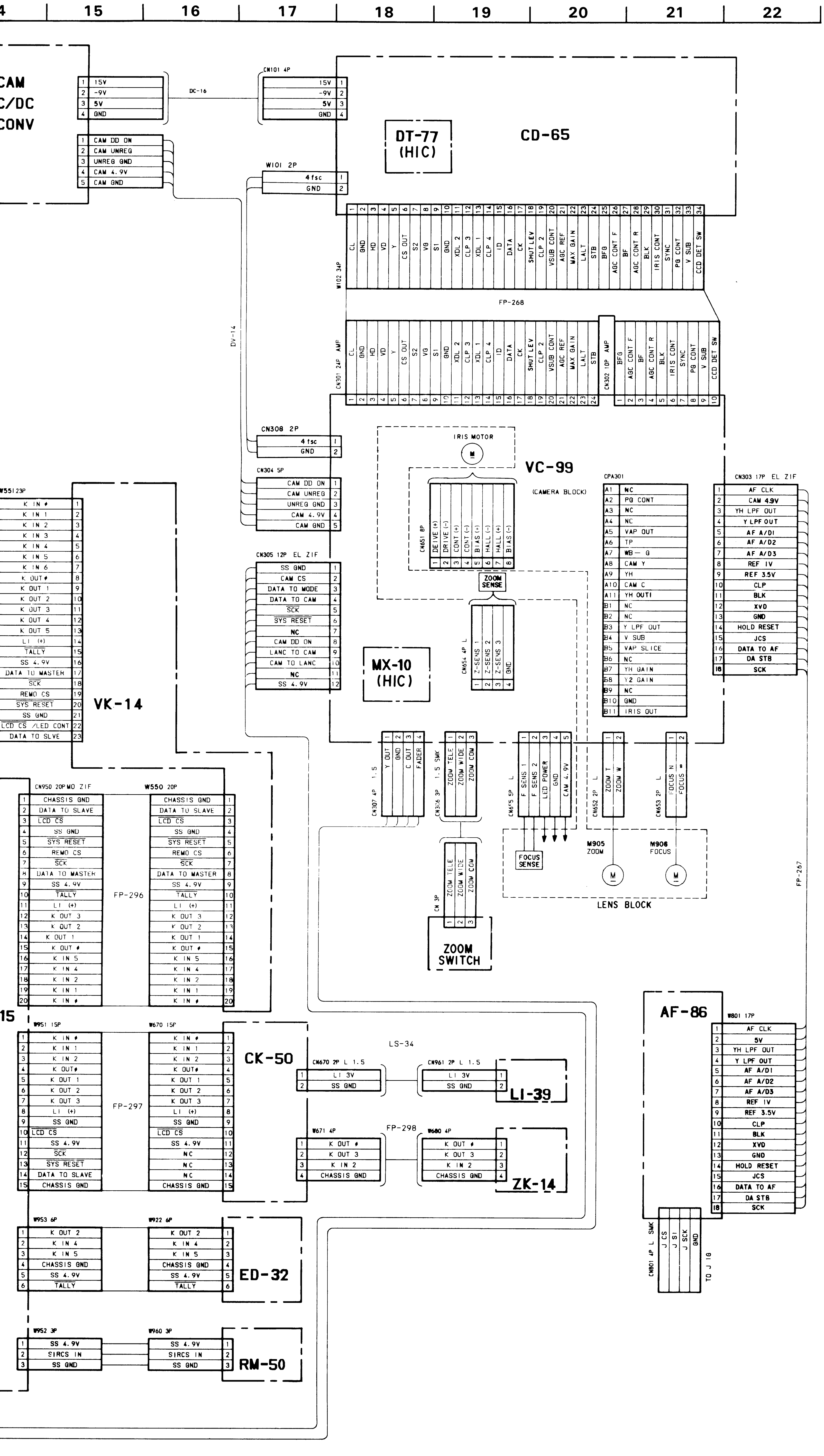

FU-100 BOARD
(See page 139.)
PS990
PS991
PS992
MOTOR UNREG
DD UNREG
SS 4.9V
VTR DD ON
CAM UNREG
RF DC OUT
W501
CN991
W901
Q990,991
CURRENT LIMITER
DC OUT
EASY CONNECTOR
SS-136 BOARD (See page 130.)
CN509
W502
W505
L902
L901
IC901
DC-DC CONVERTER,CAPSTAN/ DRUM PWM DRIVE
CTL1
CTL2
POWER ON/OFF
VREF (2.5V)
PWM COMP
SWITCHING DRIVE
VOLTAGE ERROR AMP
RV901
DD FO
TRIANGLE OSC
UVLO
SHORT CIRCUIT PROTECT
CAPSTAN/DRUM PWM DRIVE
VOLTAGE ERROR AMP
RV902
V REG
2.5V
2.4V
Q903
PWM SWITCHING
D903,L905
FLY WHEEL
L906
L907
L908
L909
VIDEO 4.9V
S/S 4.9V
EVF 4.9V
AUDIO 4.9V
Q904,905
LI+5V REG
LM+5V
PS501
DD UNREG
MOTOR UNREG
SS 4.9V
SS4.9V
IC503
EVER 5V REG
IC502
RESET, BATTERY BACK UP
V OUT
VCC
XRST
DET
VBAT
PRE
IC501
MODE CONTROL
VDD
RESET
BATT IN
LI PREEND
LANC POWER ON
VTR DD ON
CAM DD ON
Q509
K IN 0
K OUT 4
K OUT 5
DATA TO MSTER.SCK
LI(+)
EVER 5V
EVER DC
WAKE UP
CAPSTAN MOTOR DRIVE
IC504
DRUM MOTOR DRIVE
IC503
IC502
CAPSTAN /DRUM FG/PG AMP
IC507
CLOG SP/LP DETECT
IC506
ATF SERVO
IC501
L505
SERVO/ MECHANISM CONTROL
BATT SENS
IC508
NON-VOLATILE MEMORY
EVF 4.9V
CN503
CN502
CN501
CN506
CN507
CFG VCC
CAPSTAN MOTOR
CFG
RP-77BOARD
IC101
REC/PB AMP
W102
(See page 130.)
VA-67 BOARD
(See page 114.)
CN901
RF DC OUT
Q141,142
CURRENT LIMITER
J201(1/3)
AV IN/OUT (RFU DC OUT)
L515
IC201-204, IC205-207
VIDEO
AUDIO 4.9V
UNREG
S IN
IC400
AUDIO
CN401
W702
SS 4.9V
CAM DD ON
CN508
EVER 5V
IC1
LANC CONTROL
UNREG
EVER 5V
LANC OUT
LANC DC
WAKE UP
LANC
CN601
VIDEO 4.9V
EVER DC
CN703
CN704
(See page 145.)
MC-76 BOARD
IC650
MIC+B REG
MIC AMP
R655
MIC+B
MIC UNIT
CN650
W651
J651
DC OUT
SW-183 BOARD
(See page 146.)
J901
REMOTE
CN901
CN930
EVF 5V
CN931
SWITCH
Q900,901
(See page 147, 148.)
VF-26 OR VF-27 BOARD
IC901
CRT DRIVE
ELECTRIC VIEW FINDER
CT-38 BOARD
(See page 111.)
IC707-709
VIDEO SWITCH
CN705
W704
IC703,704
COMPARATOR, ENCODER
IC702
S RAM (TITLE MEMORY)
IC701
TITLER CONTROL
IC901,902
CHARACTER GENERATOR
TITLER
(See page 129.)
FP-89 BOARD
TAPE END SENSOR
S REEL FG SENSOR
FP-90 BOARD
(See page 129.)
T REEL FG SENSOR
TAPE LED
TAPE TOP SENSOR
CC-61 BOARD
(See page 130.)
CN512
CN513
CN511
MECHA CHASSIS
LOADING MOTOR
5 BOARD
CN950
LI(+)
SS 4.9V
IC950
IRCS CONTROL
VDD
SIRCS IN
952
ee page 135.)
VK-14 BOARD
W550
W551
S514
POWER
CAMERA
OFF
VTR
K OUT 5
K OUT 4
K IN 0
CN502
(See page 134.)
CAMERA DC-DC CONVERTER
CAM UNREG
15V
-9V
4.9V
CAM DD ON
CAM UNREG
CAM 4.9V
CD-65 BOARD (See page 97.)
IC101
CCD IMAGER
DT-77 BOARD
SIGNAL SEPARATOR
TIMING GENERATOR
IC121
SYNC GENERATOR
L182
L184
CN101
VC-99 BOARD
IC505,507,509,510
MX-10 BOARD
MATRIX
IC401
ENCODER
WHITE BALANCE &AE DETECT
IC301,504
EVR
IC651,656
IRIS DRIVE HALL AMP
IC652,653
FOCUS/ZOOM MOTOR DRIVE
IC501,502
CAMERA CONTROL
CN305
SS 4.9V
CAM DD ON
CN303
CAM 4.9V
CN655
CN304
(See page 94.)
(See page 107.)
AF-86 BOARD
IC801-808
AUTO FOCUS DETECT & DATA CONTROL
W801
FOCUS POSITION SENSOR

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
FP-246
W101 13P
GND
FE (X)
FE (Y)
GND
CH1' (Y)
CH1' (X)
GND
CH2' (X)
CH2' (Y)
GND
CH1 (Y)
CH1 (X)
GND
CN 13P
RP-77(HIC)
MD
W102 22P
RF GND
REC ATF RF
REC PCM RF
VIDEO 4.9V
REC C RF
REC AFM RF
PB RF OUT
REC Y RF
CH1'OUT
H CHG
RP PB 2CH
RP PB 1CH
PCM GND
PB PCM RF
PCM SEL
D SW P
E/L
SP/LP
ME/MP
RAMP
FE ON
VA PB MODE
15P SMK
C FG GND
C FG VCC
C FG (B)
C FG (A)
CAP W
CAP U
HE GND
V HE (+)
V HE (-)
HE VCC
U HE (+)
U HE (-)
CAP V
W HE (+)
W HE (-)
10P SMK
DRUM U
DRUM V
DRUM W
DRUM COM
GND
FG (COM)
FG (+)
PG (COM)
PG (+)
SMK
LOAD
UNLOAD
DEW (-)
DEW (+)
LM 5V
FP-89
FLEXIBLE
BOARD
FP-
FLEX
BOA
CN512 13P EL ZIF
T/S REEL SENS
5V
S-REEL FG
MODE SW 2
MODE SW 1
MODE SW 0
COM
CC DOWN
5V
END SENS
T3 /10
COM
N.C
CN513 11P EL ZIF
COM
ME/MP
MP HG
REC PROOF
TAPE LED
FP-247
FP-248
FP-252
CC-61
CN511 15P MD
LM 5V
END SENS
CC DOWN
UNREG GND
MODE 0
MODE 1
MODE 2
S REEL FG
REEL LED
T REEL FG
TOP SENSE
TAPE LED
REC PROOF
MP HG
ME/ MP
FP-249
CN501 22P EL ZIF
W505 15P
W510 10P
CN502 19P MD ZIF
CN508 5P L 1.5 SMK
1'CH
PCM RF
PB RF
D SWP
RP GND
SS-136
CN507 20P
REC C RF
REC AFM RF
PB RF
Y RF OUT
REC Y
JOG
H CHG
SP/LP
VA PB MODE
ME/MP
EDIT
DOP
JOG VD
SYNC DET
AV GND
DS ON
COMP SYNC
VI SWP
VIDEO 4.9V
RP PB MODE/SC
CN506 16P
SS 4.9V
E/L
SS GND
RF SWP
UN REG
1.5M OUT
AUDIO 4.9V
EVF OUT
HIFI / WIND
1.7M OUT
MIC JACKMOND/ST
MONO /ST DET
S IN
DUB AREA
HD INSERT
HD
CN505
BUZZER
GND
BZ901
BUZZER
FP-294
CN901 8P EL ZIF
VIDEO OUT
VIDEO GND
AUDIO L OUT
AUDIO GND
AUDIO R OUT
AUDIO MIX OUT
RF DC OUT
LANC
CN508 20P MD ZIF
DATA TO MASTER
DATA TO SLAVE
SCK
SP CS /A MUTE
K OUT1 /V MUTE
K OUT 2
K OUT 3
K OUT 4
K IN 6
CAM DD ON
VIDEO CS
CAM CS
EVER 5V
WAKE UP
SYS RESET
VA-67
CN401 6P1.5
AUDIO 4.9V
MIC L
AUDIO GND
MIC R
MIC ST/ MONO
HIFI / WIND
CN703 20P AMP
MASK
RF SWP
JOG VD SG
JOG
PB C
COMP SYNC
V MUTE
DS ON
EVF DS
JOG VD
CAM/TITLE C
SYNC DET
VA PB MODE
TITLE CS
EVER DC
S RAM CS
VIDEO 4.9V
CG STB
FADER CONT
VIDEO GND
CN704 15P MD ZIF
CAM/ TITLE Y
CAM Y
CAM GND
CAM C
TITLE C
TITLE Y
REF Y
SS GND
SS 4.9V
VDB 2/ Y BLK
VA PB MODE
DDS
SCK
DATA TO SLAVE
DATA TO MASTER
CN601 9P 1.5
K IN 6
K OUT 4
K OUT 3
SS GND
LANC DC
LANC
AUDIO GND
HEAD PHONE L
HEAD PHONE R
W701 4P 1.5
CAM Y
GND
CAM C
FADER CONT
W702 12P
SS GND
CAM CS
DATA TO MASTER
DATA TO SLVE
SCK
SYS RESET
AF DISPLAY
CAM DD ON
LANC TO CAM
CAM TO LANC
FADER CONT
FP-299
MV-34
SV-71
VV-3
CN705 AMP
W704 15P
CT-38
W901 9P L 1.5
CN930 6P L 1.5
EVF 4.9V
SS GND
EVF OUT
TALLY
UNREG
UNREG GND
W651 6P
CN931 6P I NON ZIF
EVF 4.9V
SS GND
EVF OUT
TALLY
AFC /UN REG
N.C /UN REG GND
CN652 2P L 1.5
GND
S/S
SS-98
W900 2P 1.5
GND
S/S
MC-76
(MIC AMP)
CN650 3P L 1.5 SMK
MIC +B
MIC L
MIC GND
MIC
SW-183


8
9
10
11
12
13
14
15
16
17
18
19
CAM DC/DC CONV
1 15V
2 -9V
3 5V
4 GND
1 CAM DD ON
2 CAM UNREG
3 UNREG GND
4 CAM 4.9V
5 CAM GND
DC-16
CN101 4P
15V 1
-9V 2
5V 3
GND 4
DT-77 (HIC)
W101 2P
4fsc 1
GND 2
FD-26
2P 1.5
CAM UNREG 1
CAM GND 2
W991 2P 1
CAM UNREG
CAM GND
FP-89 FLEXIBLE BOARD
FP-90 FLEXIBLE BOARD
T/S REEL SENS
5V
S-REEL FG
MODE SW 2
MODE SW 1
MODE SW 0
COM
CC DOWN
5V
END SENS
T3 /0
COM
N.C
CN513 11P EL ZIF
COM
ME/MP
MP HG
REC PROOF
TAPE LED
5V
TOP SENS
T-REEL LED (+)
T-REEL FG
5V
T-REEL LED (-)
CC-61
LM 5V
END SENS
CC DOWN
UNREG GND
MODE 0
MODE 1
MODE 2
S REEL FG
S REEL LED
T REEL FG
TOP SENSE
TAPE LED
REC PROOF
MP HG
ME/ MP
FP-249
DEW (-)
DEW (+)
LM 5V
END SENS
CC DOWN
UNREG GND
MODE 0
MODE 1
MODE 2
S REEL FG
REEL LED
T REEL FG
TOP SENSE
TAPE LED
REC PROOF
MP HG
ME/ MP
FU-100
CN509 23P EL ZIF
FP-295
W501 23P
1 M UNREG GND
2 M UNREG GND
3 DD UNREG GND
4 DD UNREG GND
5 DD UNREG
6 DD UNREG
7 M UNREG
8 M UNREG
9 SS 4.9V
10 SS GND
11 VTR DD ON
12 TALLY
13 SYS RESET
14 MECHA CS
15 DATA TO MASTER
16 DATA TO SLAVE
17 SCK
18 BUZZER
19 SYSTEM SYNC
20 EE CS
21 EE SCK
22 DATA TO EE
23 DATA TO MODE
CN503 6P L 1.5
1 EVF 4.9V
2 SS GND
3 EVF OUT
4 TALLY
5 UNREG
6 UNREG GND
W502 20P
1 DATA TO MASTER
2 DATA TO SLAVE
3 SCK
4 SP CS/A MUTE
5 K OUT1 /V MUTE
6 K OUT 2
7 K OUT 3
8 K OUT 4
9 K IN 6
10 CAM DD ON
11 CAM CS
12 VIDEO CS
13 EVER 5V
14 LANC POWER ON
15 SYS RESET
16 CAM / LINE
17 CG STB
18 SRAM CS
19 TITLE CS
20 EVER DC
CN508 20P MO ZIF
FP-293
FP-294
AUDIO MIX OUT
RF DC OUT
LANC
CN502 23P MO ZIF
FP-308
W551 23P
1 K IN #
2 K IN 1
3 K IN 2
4 K IN 3
5 K IN 4
6 K IN 5
7 K IN 6
8 K OUT#
9 K OUT 1
10 K OUT 2
11 K OUT 3
12 K OUT 4
13 K OUT 5
14 LI (+)
15 TALLY
16 SS 4.9V
17 DATA TO MASTER
18 SCK
19 REMO CS
20 SYS RESET
21 SS GND
22 LCD CS /LED CONT
23 DATA TO SLVE
VK-14
W901 8P
8 VIDEO OUT
7 VIDEO GND
6 AUDIO L OUT
5 AUDIO GND
4 AUDIO R OUT
3 AUDIO MIX OUT
2 RF DC OUT
1 LANC
DK-15
CN950 20P MO ZIF
FP-296
W550 20P
1 CHASSIS GND
2 DATA TO SLAVE
3 LCD CS
4 SS GND
5 SYS RESET
6 REMO CS
7 SCK
8 DATA TO MASTER
9 SS 4.9V
10 TALLY
11 LI (+)
12 K OUT 3
13 K OUT 2
14 K OUT 1
15 K OUT #
16 K IN 5
17 K IN 4
18 K IN 2
19 K IN 1
20 K IN #
W951 15P
FP-297
W670 15P
1 K IN #
2 K IN 1
3 K IN 2
4 K OUT#
5 K OUT 1
6 K OUT 2
7 K OUT 3
8 LI (+)
9 SS GND
10 LCD CS
11 SS 4.9V
12 SCK / NC
13 SYS RESET / NC
14 DATA TO SLAVE / NC
15 CHASSIS GND
CK-50
CN670 2P L 1.5
1 LI 3V
2 SS GND
LS-34
CN961 2P L 1.5
LI 3V 1
SS GND 2
W671 4P
FP-298
W680 4P
1 K OUT #
2 K OUT 3
3 K IN 2
4 CHASSIS GND
W953 6P
W922 6P
1 K OUT 2
2 K IN 4
3 K IN 5
4 CHASSIS GND
5 SS 4.9V
6 TALLY
ED-32
W952 3P
W960 3P
1 SS 4.9V
2 SIRCS IN
3 SS GND
RM-50
W701 4P 1.5
CAM Y
GND
CAM C
FADER CONT
W702 12P
SS GND
CAM CS
DATA TO MASTER
DATA TO SLVE
SCK
SYS RESET
AF DISPLAY
CAM DD ON
LANC TO CAM
CAM TO LANC
FADER CONT
SS 4.9V
FP-251
VC-28
VV-34
CN930 6P L 1.5
EVF 4.9V
SS GND
EVF OUT
TALLLY
UNREG
UNREG GND
HEAD PHONE R
-183
CN931 6P I NON ZIF
FP-264
CN904 6P NON ZIF
1 EVF 4.9V
2 SS GND
3 EVF OUT
4 TALLY
5 AFC /UN REG
6 N.C/UN REG GND
VF-26 or -27
W102 34P
CL
GND
HD
VD
Y
CS OUT
S2
VG
S1
GND
XDL 2
CLP 3
XDL 1
CLP 4
ID
DATA
FP-26
CN301 24P AMP
DV-14
CN308 2P
4fsc 1
GND 2
CN304 5P
CAM DD ON 1
CAM UNREG 2
UNREG GND 3
CAM 4.9V 4
CAM GND 5
CN305 12P EL ZIF
SS GND 1
CAM CS 2
DATA TO MODE 3
DATA TO CAM 4
SCK 5
SYS RESET 6
NC 7
CAM DD ON 8
LANC TO CAM 9
CAM TO LANC 10
NC 11
SS 4.9V 12
IRIS MOTOR
CN651 8P
DRIVE (+)
DRIVE (-)
CONT (-)
CONT (+)
BIAS (+)
HALL (-)
HALL (+)
BIAS (-)
ZOOM SENSE
CN654 4P L
Z-SENS 1
Z-SENS 2
Z-SENS 3
GND
MX-10 (HIC)
CN307 4P 1.5
Y OUT
GND
C OUT
FADER
CN306 3P 1.5 SMK
ZOOM TELE
ZOOM WIDE
ZOOM COM
CN655 5P L
CN 3P
ZOOM TELE
ZOOM WIDE
ZOOM COM
ZOOM SWITCH



14
15
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22
CAM
C/DC
CONV
15V
-9V
5V
GND
DC-16
CN101 4P
CAM DD ON
CAM UNREG
UNREG GND
CAM 4.9V
CAM GND
W101 2P
4fsc
GND
DT-77
(HIC)
CD-65
W102 34P
CL
GND
HD
VD
Y
CS OUT
S2
VG
S1
GND
XDL 2
CLP 3
XDL 1
CLP 4
ID
DATA
CK
SHUT LEV
CLP 2
VSUB CONT
AGC REF
MAX GAIN
LALT
STB
BFG
AGC CONT F
BF
AGC CONT R
BLK
IRIS CONT
SYNC
PG CONT
V SUB
CCD DET SW
FP-268
DV-14
CN301 24P AMP
CN302 10P AMP
CN308 2P
CN304 5P
CN305 12P EL ZIF
SS GND
CAM CS
DATA TO MODE
DATA TO CAM
SCK
SYS RESET
NC
CAM DD ON
LANC TO CAM
CAM TO LANC
SS 4.9V
IRIS MOTOR
VC-99
(CAMERA BLOCK)
CN651 8P
DRIVE (+)
DRIVE (-)
CONT (+)
CONT (-)
BIAS (+)
HALL (-)
HALL (+)
BIAS (-)
ZOOM SENSE
CN654 4P L
Z-SENS 1
Z-SENS 2
Z-SENS 3
GND
MX-10
(HIC)
CPA301
A1 NC
A2 PG CONT
A3 NC
A4 NC
A5 VAP OUT
A6 TP
A7 WB – G
A8 CAM Y
A9 YH
A10 CAM C
A11 YH OUT1
B1 NC
B2 NC
B3 Y LPF OUT
B4 V SUB
B5 VAP SLICE
B6 NC
B7 YH GAIN
B8 Y2 GAIN
B9 NC
B10 GND
B11 IRIS OUT
CN303 17P EL ZIF
AF CLK
CAM 4.9V
YH LPF OUT
Y LPF OUT
AF A/D1
AF A/D2
AF A/D3
REF 1V
REF 3.5V
CLP
BLK
XVD
GND
HOLD RESET
JCS
DATA TO AF
DA STB
SCK
CN307 4P L 1.5
Y OUT
GND
C OUT
FADER
CN306 3P 1.5 SMK
ZOOM TELE
ZOOM WIDE
ZOOM COM
CN655 5P L
F SENS 1
F SENS 2
LED POWER
GND
CAM 4.9V
CN652 2P L
ZOOM T
ZOOM W
CN653 2P L
FOCUS N
FOCUS ∞
FOCUS SENSE
M905 ZOOM
M906 FOCUS
LENS BLOCK
CN 3P
ZOOM SWITCH
FP-267
W551 23P
K IN ∞
K IN 1
K IN 2
K IN 3
K IN 4
K IN 5
K IN 6
K OUT ∞
K OUT 1
K OUT 2
K OUT 3
K OUT 4
K OUT 5
LI (+)
TALLY
SS 4.9V
DATA TO MASTER
SCK
REMO CS
SYS RESET
SS GND
LCD CS /LED CONT
DATA TO SLVE
VK-14
CN950 20P MO ZIF
W550 20P
CHASSIS GND
DATA TO SLAVE
LCD CS
FP-296
15
W951 15P
W670 15P
FP-297
CK-50
LS-34
CN670 2P L 1.5
CN961 2P L 1.5
LI 3V
SS GND
LI-39
W671 4P
W680 4P
FP-298
K OUT ∞
K OUT 3
K IN 2
CHASSIS GND
ZK-14
W953 6P
W922 6P
K OUT 2
K IN 4
K IN 5
ED-32
W952 3P
W960 3P
SS 4.9V
SIRCS IN
RM-50
AF-86
W801 17P
5V
CN801 4P L SMK
J CS
J SI
J SCK
GND
TO J 10

4-2. PRINTED WIRING BOARDS AND SCHEMA

THIS NOTE IS COMMON FOR PRINTED W
AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is p

- **For printed wiring boards.**
- ● : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ▩ : Pattern of the rear side.*
- Circled numbers refer to waveforms.*

- **For schematic diagram.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum because it is damaged by the heat.
- All resistors are in ohms, 1/10W or 1/16W unless o
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μ 50V or less are not indicated except for electrolytics tantalums.
- All variable and adjustable resistors have characteris unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repair.*
- ━ : B + Line*
- Circled numbers refer to waveforms.*
- ⇨ : IN/OUT direction of B (+, −) line.*

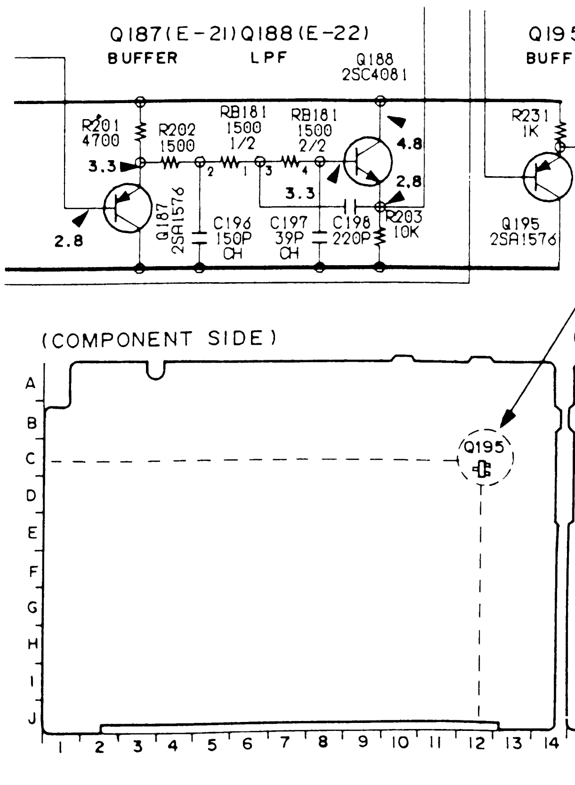
Note: The components identified by mark ⚠ or dott line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

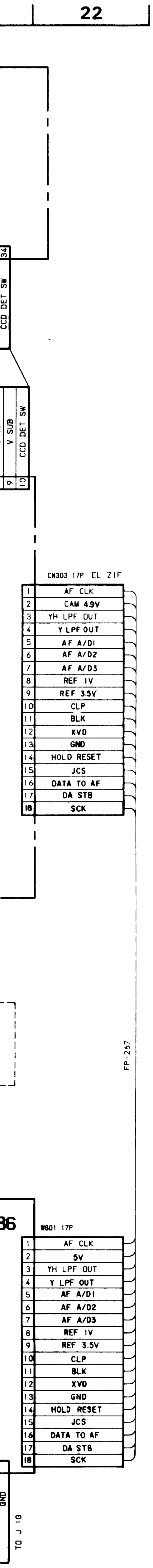
* Indicated by the color red.

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations o semiconductors (IC, transistor, diodes) are indicated in shown below. This enables to find the location on the easily when servicing.



Q187(E-21)Q188(E-22)
BUFFER
LPF
Q188
2SC4081
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
4.8
3.3
2.8
3.3
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
Q19
BUFF
R231
1K
Q195
2SA1576
(COMPONENT SIDE)
A
B
C
D
E
F
G
H
I
J
Q195
1
2
3
4
5
6
7
8
9
10
11
12
13
14


22
CCD DET SW
V SUB
CCD DET SW
CN303 17P EL ZIF
AF CLK
CAM 4.9V
YH LPF OUT
Y LPF OUT
AF A/D1
AF A/D2
AF A/D3
REF IV
REF 3.5V
CLP
BLK
XVD
GND
HOLD RESET
JCS
DATA TO AF
DA STB
SCK
FP-267
W801 17P
AF CLK
5V
YH LPF OUT
Y LPF OUT
AF A/D1
AF A/D2
AF A/D3
REF IV
REF 3.5V
CLP
BLK
XVD
GND
HOLD RESET
JCS
DATA TO AF
DA STB
SCK
GND
TO J 16

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.

(In addition to this, the necessary note is printed in each block.)

- **For printed wiring boards.**
- ● : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side. *
- Circled numbers refer to waveforms. *

- **For schematic diagram.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W or 1/16W unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.

- All capacitors are in μF unless otherwise noted. pF : μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repair. *
- ━━ : B + Line *
- Circled numbers refer to waveforms. *
- ➾ : IN/OUT direction of B (+, –) line. *

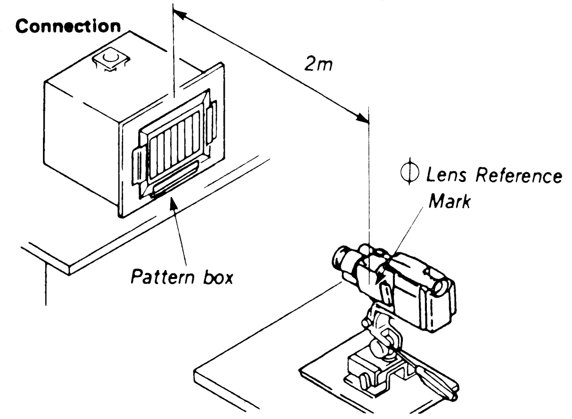
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

* Indicated by the color red.

- **For voltage and waveforms. (CAMERA REC mode)**
- Voltage and waveform measuring conditions: *
  (1) Sample object: Pattern box color bars. *
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more). *

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

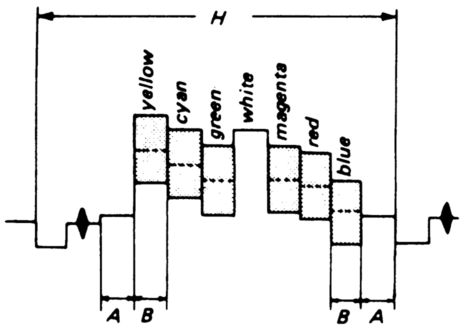


Fig. a Video output waveform.

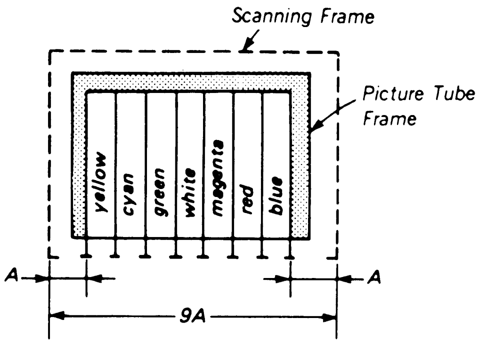
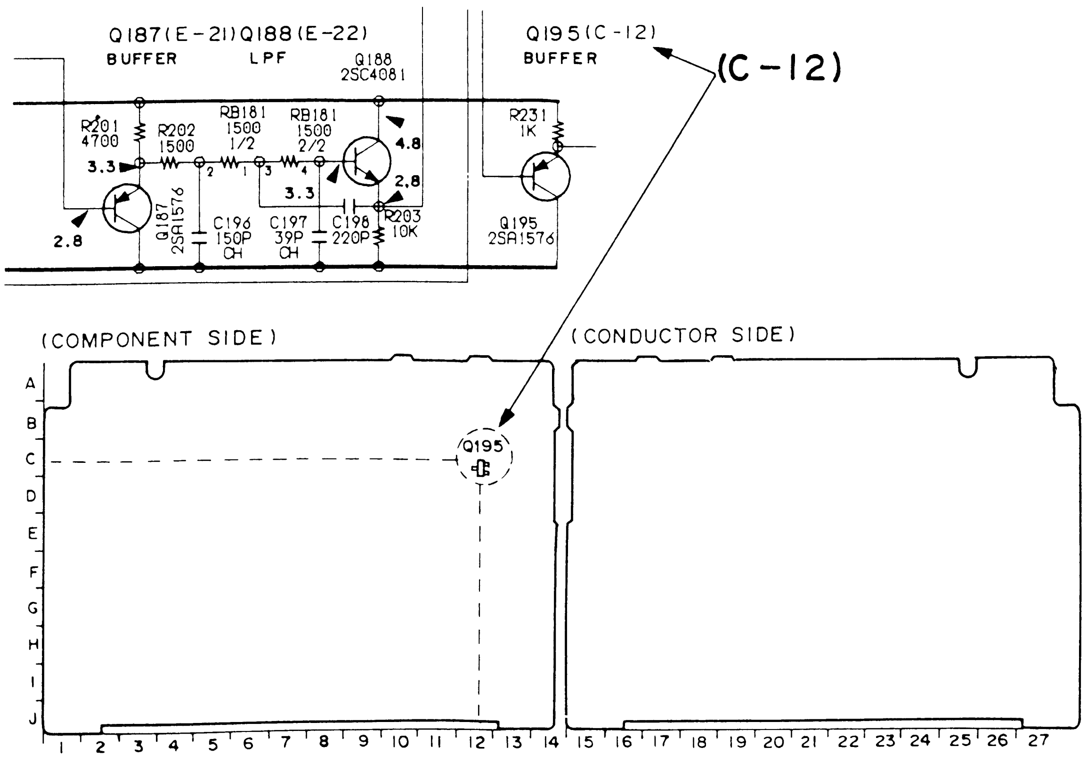

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

- **For voltage and waveforms. (REC/PB mode)**
- Voltages are dc between ground and measurement points. *
- Readings are taken with a color-bar signal input. *
- Readings are taken with a digital multimeter (DC10MΩ). *
- Voltage variations may be noted due to normal production tolerances. *

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red as shown below. This enables to find the location on the board easily when servicing.


Q187(E-21)Q188(E-22)
BUFFER
LPF
Q188
2SC4081
Q195(C-12)
BUFFER
(C-12)
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
R231
1K
3.3
2.8
3.3
4.8
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
Q195
2SA1576
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
12
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27

Precautions for replacement of CCD imager block.

- With a pair of IC101 (CCD imager) on the CD-65 complete board and IC001 (corrector ROM) on the DT-77 complete board, it is used a repair part of the CCD imager block.
  Since corrector ROM IC is manufactured to match the CCD imager, replacement of a single unit of the CCD imager corrector ROM cannot be allowed.
- When both a CCD imager and the corrector ROM, replace both the CCD imager and the corrector ROM, when a corrector ROM is not mounted on the service set, install a corrector ROM which is supplied anew.
- IC101 (CCD imager) is not mounted on the CD-65 complete board to be supplied as a repair part, and IC001 (corrector ROM) is not mounted on the DT-77 complete board to be supplied as a repair part. When the respective boards are replaced, remove the respective ICs from the old boards and install them to the new once respectively.
- After the CCD imager block has been replaced, perform the entire adjustments of the camera section.
- CCD imager is structurally in case of being broken down by static electricity.
  For this reason, take care to handle it as well as MOS IC. Moreover, care should be taken for dust not to be stuck on the light reseiving section and for strong light not to get into there.

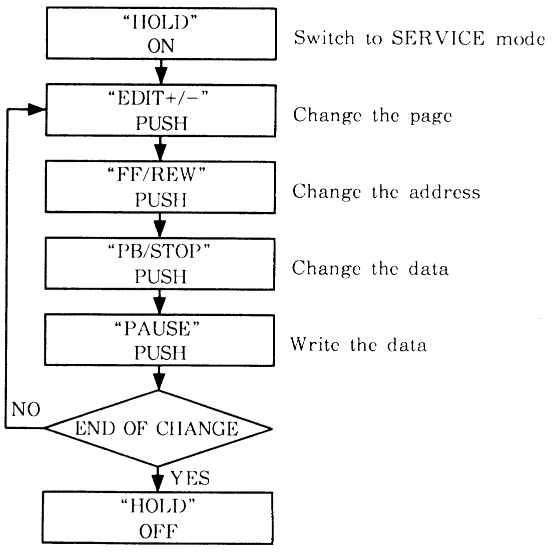
[To set the AEP, UK model to REC mode]

1. Enter SERVICE mode with the adjustment remote control. (Refer to page 190 for details.)
2. Set the data at adress: 00 on page: 1 to 01 ∗ 1.
3. Set the data at address: 02 on page: D to 03 ∗ 1.
4. Turn the power of the set off.
5. Turn the power of the set on.
6. Make shorting once for S510 land (REC switch) of VK-14 board.

After voltage measurement and adjustment, restore as follows:

1. Set the data at address: 00 on page: 1 to 01 ∗ 1.
2. Set the data at address: 02 on page: D to 02 ∗ 1.
3. Turn the power of the set off.

∗1 [To change the data]


"HOLD" ON
Switch to SERVICE mode
"EDIT+/−" PUSH
Change the page
"FF/REW" PUSH
Change the address
"PB/STOP" PUSH
Change the data
"PAUSE" PUSH
Write the data
NO
END OF CHANGE
YES
"HOLD" OFF

[To input VIDEO signal to the AEP, UK model]

Input VIDEO signal to pin ⑨ of the land for S201 on the VA-67 board.
(GND for J201 VIDEO output terminal should be used for grounding.)

CD-65 (CCD IMAGER), VC-99 (CAMERA PROCESS, ZOOM/FOCUS) SCHEMATIC DIAGRAM

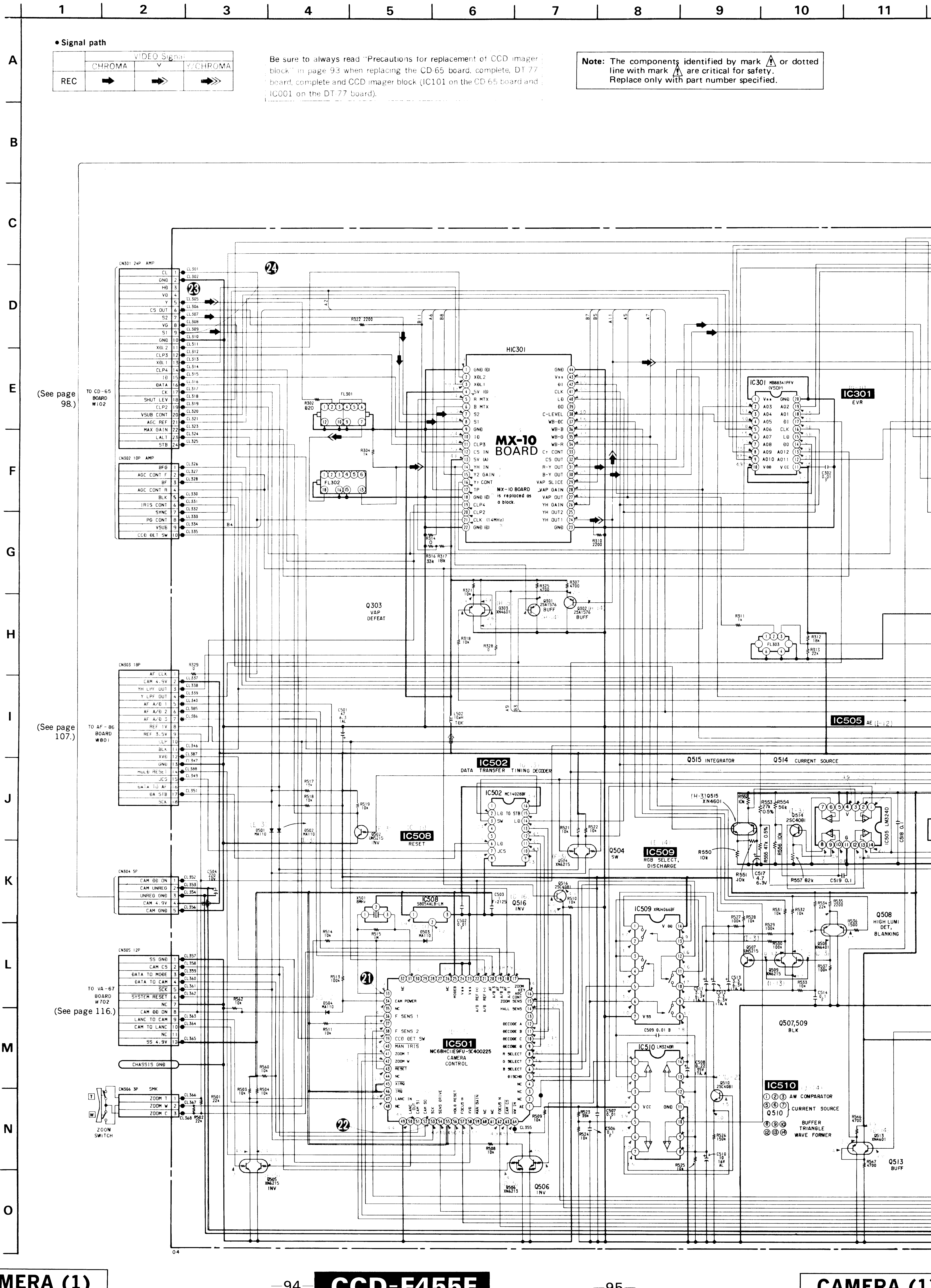
—Ref. No. CD-65 and VC-99 BOARDS : 1000 series—

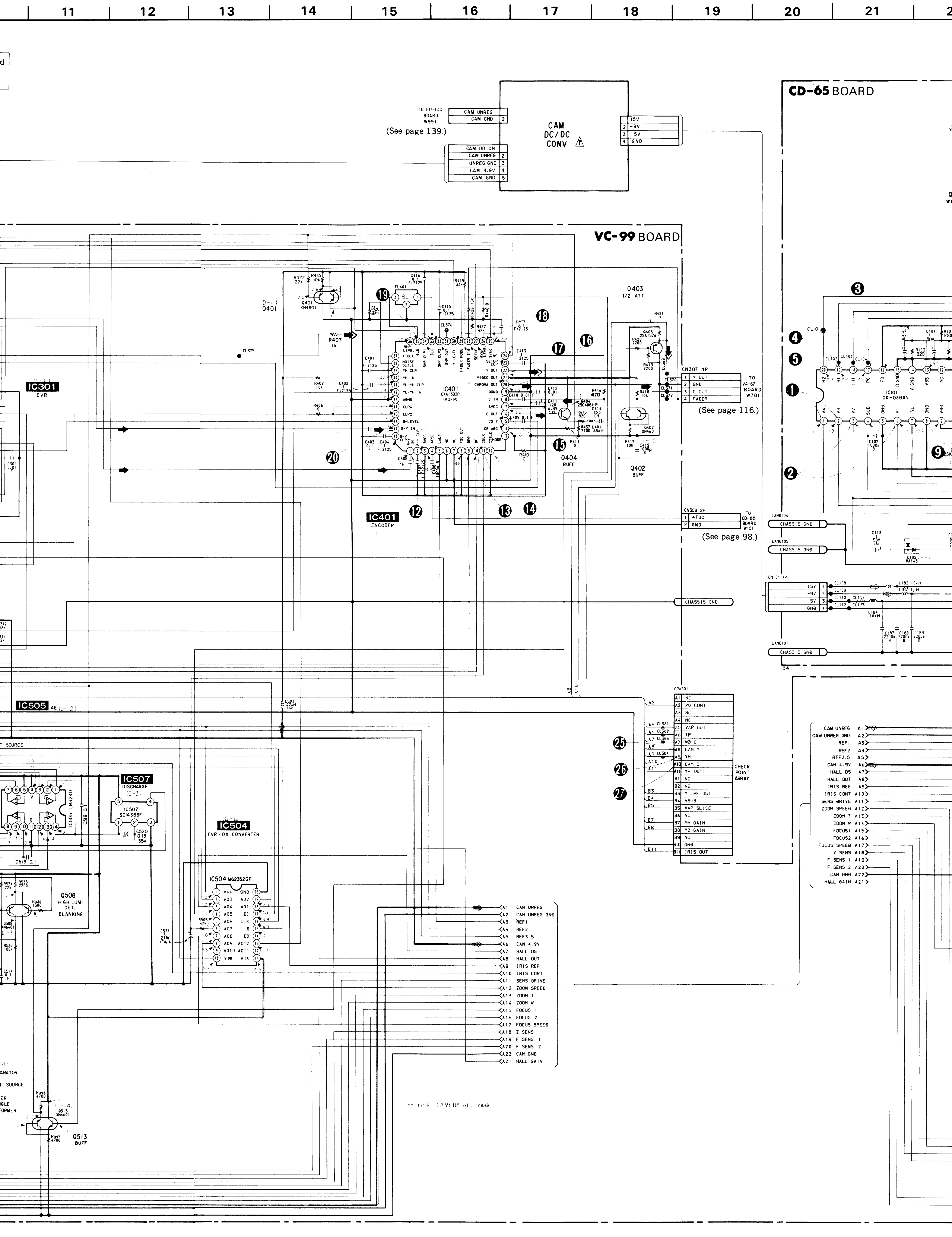
• Signal path

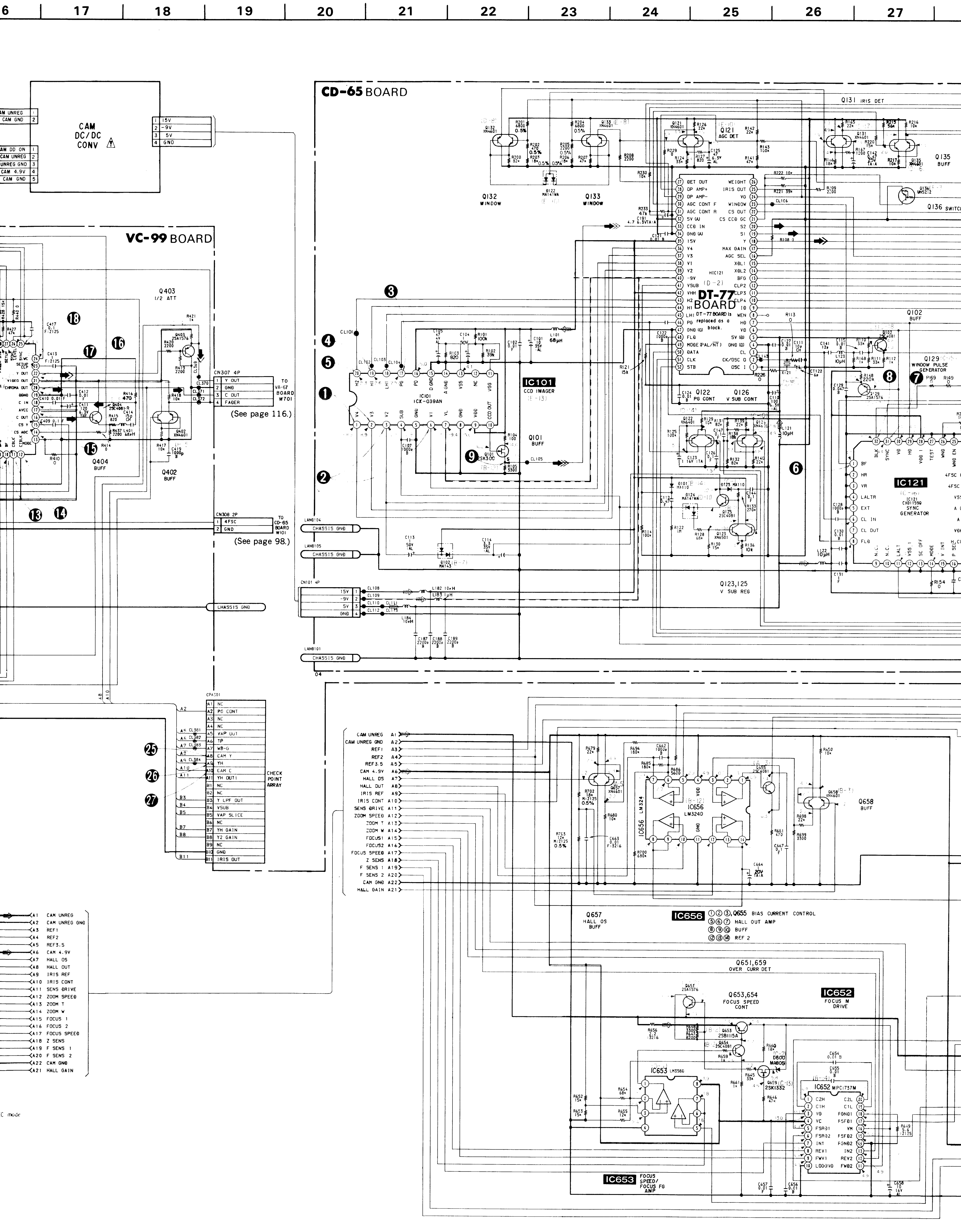
	VIDEO Signal		
	CHROMA	Y	Y/CHROMA
REC	➡	➡»	➡»»

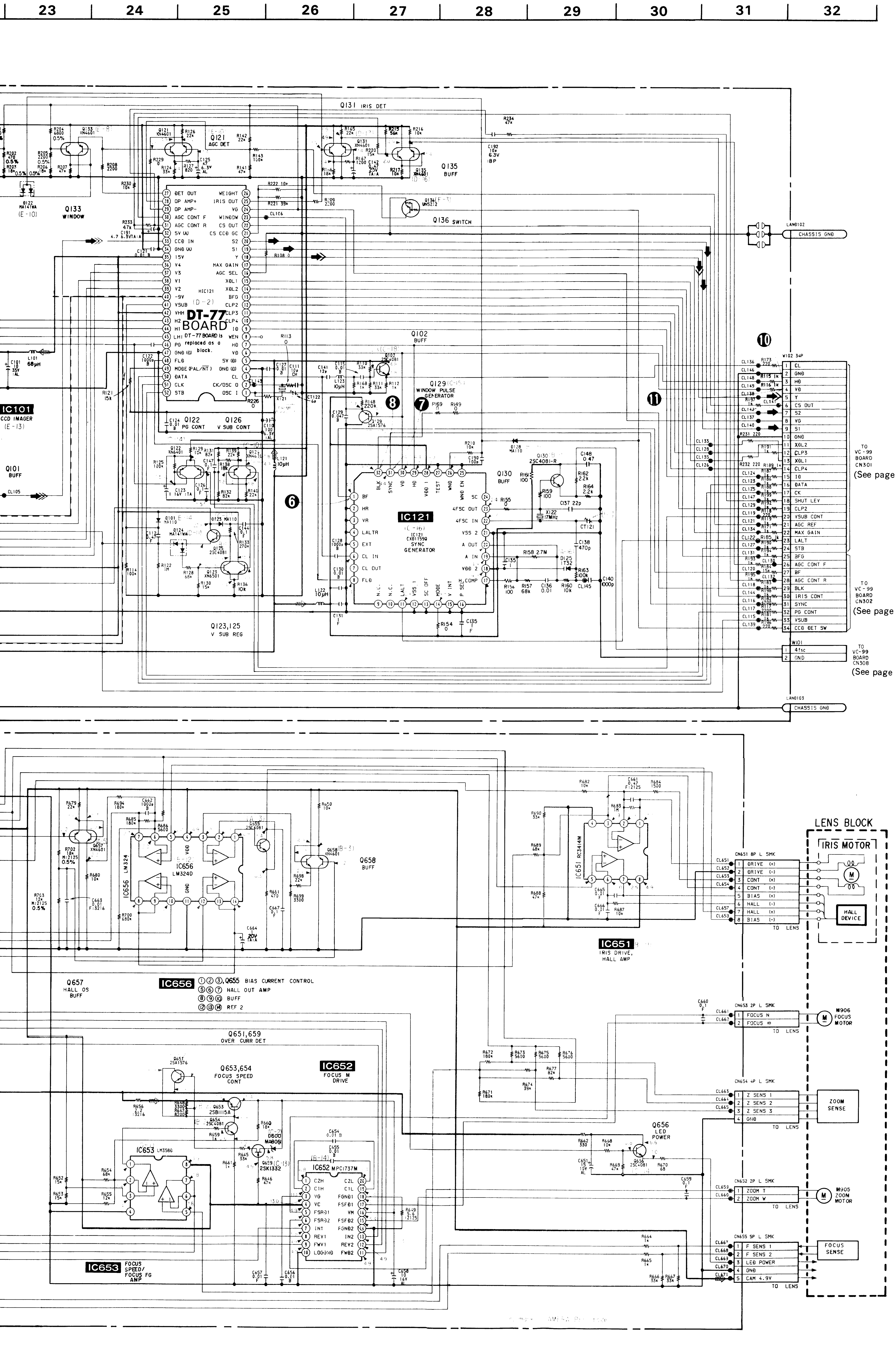
Be sure to always read "Precautions for replacement of CCD imager block" in page 93 when replacing the CD-65 board, complete, DT-77 board, complete and CCD imager block (IC101 on the CD-65 board and IC001 on the DT-77 board).

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.


1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
(See page 98.)
TO CD-65 BOARD W102
CN301 24P AMP
CL
GND
HD
VD
Y
CS OUT
S2
VG
S1
GND
XOL2
CLP3
XOL1
CLP4
ID
DATA
CK
SHUT LEV
CLP2
VSUB CONT
AGC REF
MAX GAIN
LALT
STB
CN302 10P AMP
BFG
AGC CONT F
BF
AGC CONT R
BLK
IRIS CONT
SYNC
PG CONT
VSUB
CCD DET SW
㉓
㉔
HIC301
MX-10 BOARD
MX-10 BOARD is replaced as a block.
FL301
FL302
R302 820
R322 2200
Q303 VAP DEFEAT
Q301 2SA1576 BUFF
Q302 2SA1576 BUFF
Q303 XN4601
IC301 MB88341PFV (VSOP)
IC301 EVR
FL303
(See page 107.)
TO AF-86 BOARD W801
CN303 18P
AF CLK
CAM 4.9V
YH LPF OUT
Y LPF OUT
AF A/D 1
AF A/D 2
AF A/D 3
REF 1V
REF 3.5V
CLP
BLK
XVD
GND
HOLD RESET
JCS
DATA TO AF
DA STB
SCK
IC502 DATA TRANSFER TIMING DECODER
IC502 MC14028BF
IC505 AE
Q515 INTEGRATOR
Q514 CURRENT SOURCE
Q515 XN4601
Q514 2SC4081
IC505 LM324D
IC508 RESET
D501 MA110
D502 MA110
Q502 UN5215 INV
Q504 SW
Q504 XN6215
IC509 RGB SELECT, DISCHARGE
IC509 XRU4066BF
Q516 INV
Q516 2SC4081
CN304 5P
CAM DD ON
CAM UNREG
UNREG GND
CAM 4.9V
CAM GND
X501 8MHz
IC508 S8054ALB-LM
D503 MA110
Q508 HIGH LUMI DET, BLANKING
Q508 XN6401
Q507 UN5215
Q509 XN6215
Q507,509 BLK
CN305 12P
TO VA-67 BOARD W702
(See page 116.)
SS GND
CAM CS
DATA TO MODE
DATA TO CAM
SCK
SYSTEM RESET
NC
CAM DD ON
LANC TO CAM
CAM TO LANC
NC
SS 4.9V
㉑
IC501 MC68HC11E9FU-SC400225 CAMERA CONTROL
D504 MA110
IC510 LM324DR
IC510
①②③ AW COMPARATOR
⑤⑥⑦ CURRENT SOURCE
Q510
⑧⑨⑩ BUFFER
⑫⑬⑭ TRIANGLE WAVE FORMER
Q510 2SC4081
Q513 BUFF
Q513 XN4601
CHASSIS GND
CN306 3P SMK
ZOOM T
ZOOM W
ZOOM C
ZOOM SWITCH
T
W
㉒
Q505 XN6215 INV
Q506 XN6215
Q506 INV


VC-99 BOARD
CD-65 BOARD
CAM DC/DC CONV
TO FU-100 BOARD W991
(See page 139.)
CAM UNREG
CAM GND
CAM DD ON
UNREG GND
CAM 4.9V
15V
-9V
5V
GND
IC401 CXA1392R (VQFP)
IC401 ENCODER
IC301 EVR
IC505 AE
IC507 DISCHARGE
IC507 SC14S66F
IC504 EVR/DA CONVERTER
IC504 M62352GP
IC505 LM3240
IC101 ICX-039AN
Q401 XN4601
Q403 1/2 ATT
Q403 2SA1576
Q404 2SC4081-R
Q404 BUFF
Q402 XN4601
Q402 BUFF
Q508 HIGH LUMI DET, BLANKING
Q513 XN4601
Q513 BUFF
CN307 4P
Y OUT
GND
C OUT
FADER
TO VA-67 BOARD W701
(See page 116.)
CN308 2P
4FSC
GND
TO CD-65 BOARD W101
(See page 98.)
CHASSIS GND
CN101 4P
CHECK POINT ARRAY
CP4301
NC
PG CONT
VAP OUT
TP
WB-G
CAM Y
YH
CAM C
YH OUT1
Y LPF OUT
VSUB
VAP SLICE
YH GAIN
Y2 GAIN
IRIS OUT
A1 CAM UNREG
A2 CAM UNREG GND
A3 REF1
A4 REF2
A5 REF3.5
A6 CAM 4.9V
A7 HALL OS
A8 HALL OUT
A9 IRIS REF
A10 IRIS CONT
A11 SENS DRIVE
A12 ZOOM SPEED
A13 ZOOM T
A14 ZOOM W
A15 FOCUS 1
A16 FOCUS 2
A17 FOCUS SPEED
A18 Z SENS
A19 F SENS 1
A20 F SENS 2
A22 CAM GND
A21 HALL GAIN
no mark : CAMERA REC mode
11
12
13
14
15
16
17
18
19
20
21


16
17
18
19
20
21
22
23
24
25
26
27
CAM DC/DC CONV
15V
-9V
5V
GND
CAM UNREG
CAM GND
CAM DD ON
CAM UNREG
UNREG GND
CAM 4.9V
CAM GND
VC-99 BOARD
Q403 1/2 ATT
Q404 BUFF
Q402 BUFF
CN307 4P
Y OUT
GND
C OUT
FADER
TO VA-67 BOARD W701
(See page 116.)
CN308 2P
4FSC
GND
TO CD-65 BOARD W101
(See page 98.)
CD-65 BOARD
Q131 IRIS DET
Q132 WINDOW
Q133 WINDOW
Q121 AGC DET
Q135 BUFF
Q136 SWITCH
DT-77 BOARD
DT-77 BOARD is replaced as a block.
HIC121
IC101 CCD IMAGER
IC101 ICX-039AN
Q101 BUFF
Q102 BUFF
Q129 WINDOW PULSE GENERATOR
IC121 CX811590 SYNC GENERATOR
Q122 PG CONT
Q126 V SUB CONT
Q123,125 V SUB REG
CHASSIS GND
CN101 4P
15V
-9V
5V
GND
CPA301
CHECK POINT ARRAY
NC
PG CONT
VAP OUT
TP
WB-G
CAM Y
YH
CAM C
YH OUT1
Y LPF OUT
VSUB
VAP SLICE
YH GAIN
Y2 GAIN
IRIS OUT
CAM UNREG
CAM UNREG GND
REF1
REF2
REF3.5
CAM 4.9V
HALL OS
HALL OUT
IRIS REF
IRIS CONT
SENS DRIVE
ZOOM SPEED
ZOOM T
ZOOM W
FOCUS1
FOCUS2
FOCUS SPEED
Z SENS
F SENS 1
F SENS 2
CAM GND
HALL GAIN
IC656 LM324D
Q657 HALL OS BUFF
Q658 BUFF
IC656 ①②③,Q655 BIAS CURRENT CONTROL
⑤⑥⑦ HALL OUT AMP
⑧⑨⑩ BUFF
⑫⑬⑭ REF 2
Q651,659 OVER CURR DET
Q653,654 FOCUS SPEED CONT
IC652 FOCUS M DRIVE
IC653 LM358G
IC652 MPC1737M
IC653 FOCUS SPEED/FOCUS FG AMP
C mode

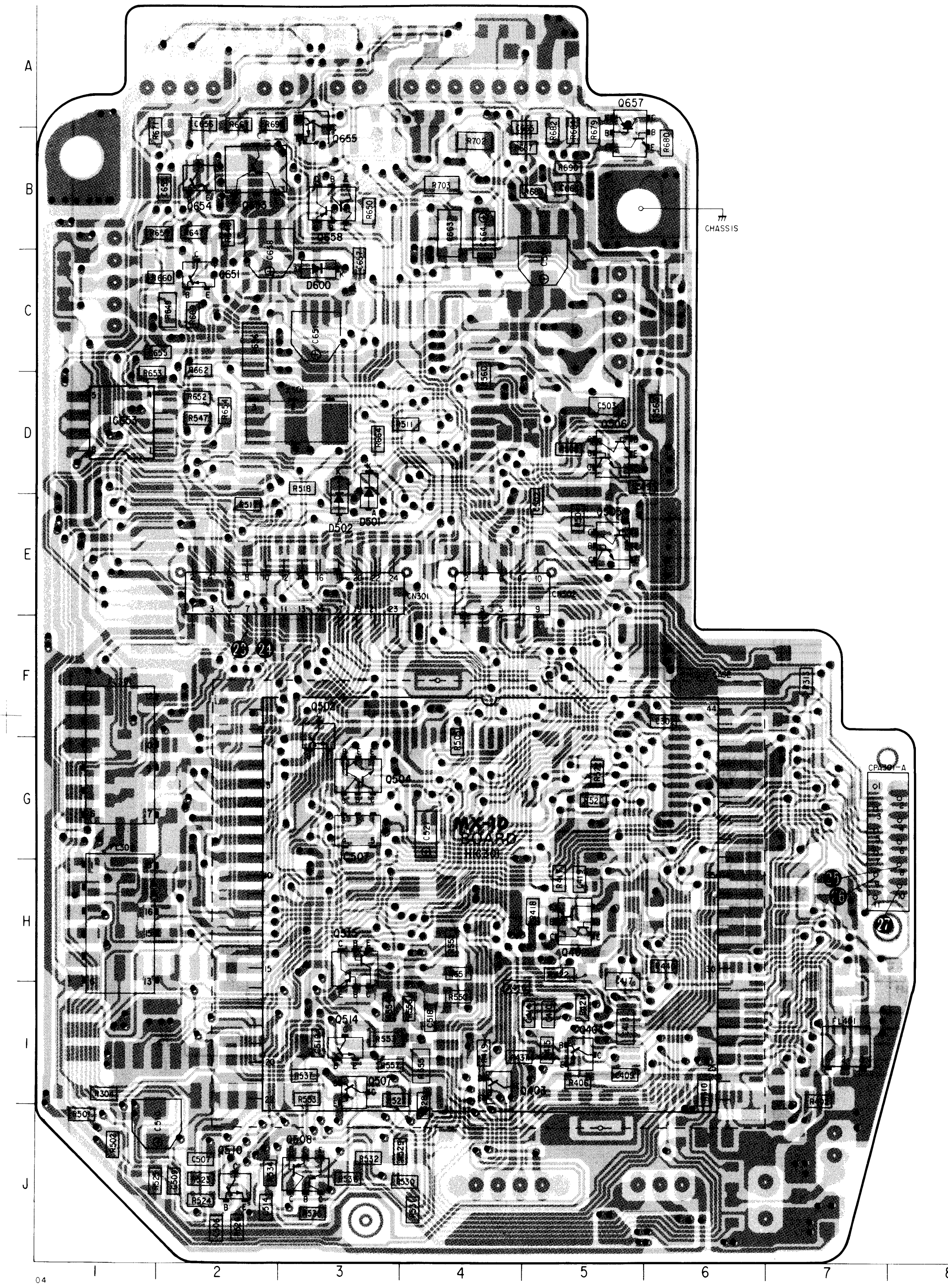

23
24
25
26
27
28
29
30
31
32
Q131 IRIS DET
Q121 AGC DET
Q133 WINDOW
Q135 BUFF
Q136 SWITCH
DT-77 BOARD
DT-77 BOARD is replaced as a block.
HIC121
IC101 CCD IMAGER
Q101 BUFF
Q102 BUFF
Q122 PG CONT
Q126 V SUB CONT
Q123,125 V SUB REG
Q129 WINDOW PULSE GENERATOR
Q130 BUFF
IC121
IC121 CXD1159Q SYNC GENERATOR
X122 17MHz
⑥
⑦
⑧
⑩
⑪
W102 34P
CL
GND
HD
VD
Y
CS OUT
S2
VG
S1
GND
XOL2
CLP3
XOL1
CLP4
ID
DATA
CK
SHUT LEV
CLP2
VSUB CONT
AGC REF
MAX GAIN
LALT
STB
BFG
AGC CONT F
BF
AGC CONT R
BLK
IRIS CONT
SYNC
PG CONT
VSUB
CCD DET SW
TO VC-99 BOARD CN301 (See page 94.)
TO VC-99 BOARD CN302 (See page 94.)
W101
4fsc
GND
TO VC-99 BOARD CN308 (See page 96.)
LAN0102 CHASSIS GND
LAN0103 CHASSIS GND
IC656 LM324D
Q658 BUFF
Q657 HALL OS BUFF
IC656 ①②③,Q655 BIAS CURRENT CONTROL
⑤⑥⑦ HALL OUT AMP
⑧⑨⑩ BUFF
⑫⑬⑭ REF 2
IC651 RC3414M
IC651 IRIS DRIVE, HALL AMP
Q651,659 OVER CURR DET
Q653,654 FOCUS SPEED CONT
IC652 FOCUS M DRIVE
IC652 MPC1737M
IC653 LM358D
IC653 FOCUS SPEED/ FOCUS FG AMP
Q656 LED POWER
CN651 8P L SMK
DRIVE (+)
DRIVE (−)
CONT (+)
CONT (−)
BIAS (+)
HALL (−)
HALL (+)
BIAS (−)
TO LENS
CN653 2P L SMK
FOCUS N
FOCUS ∞
CN654 4P L SMK
Z SENS 1
Z SENS 2
Z SENS 3
GND
CN652 2P L SMK
ZOOM T
ZOOM W
CN655 5P L SMK
F SENS 1
F SENS 2
LED POWER
GND
CAM 4.9V
LENS BLOCK
IRIS MOTOR
HALL DEVICE
M906 FOCUS MOTOR
ZOOM SENSE
M905 ZOOM MOTOR
FOCUS SENSE

CAMERA (1)   CAMERA (1)

CD-65 (CCD IMAGER), VC-99 (CAMERA PROCESS, ZOOM/FOCUS) PRINTED WIRING BOARDS

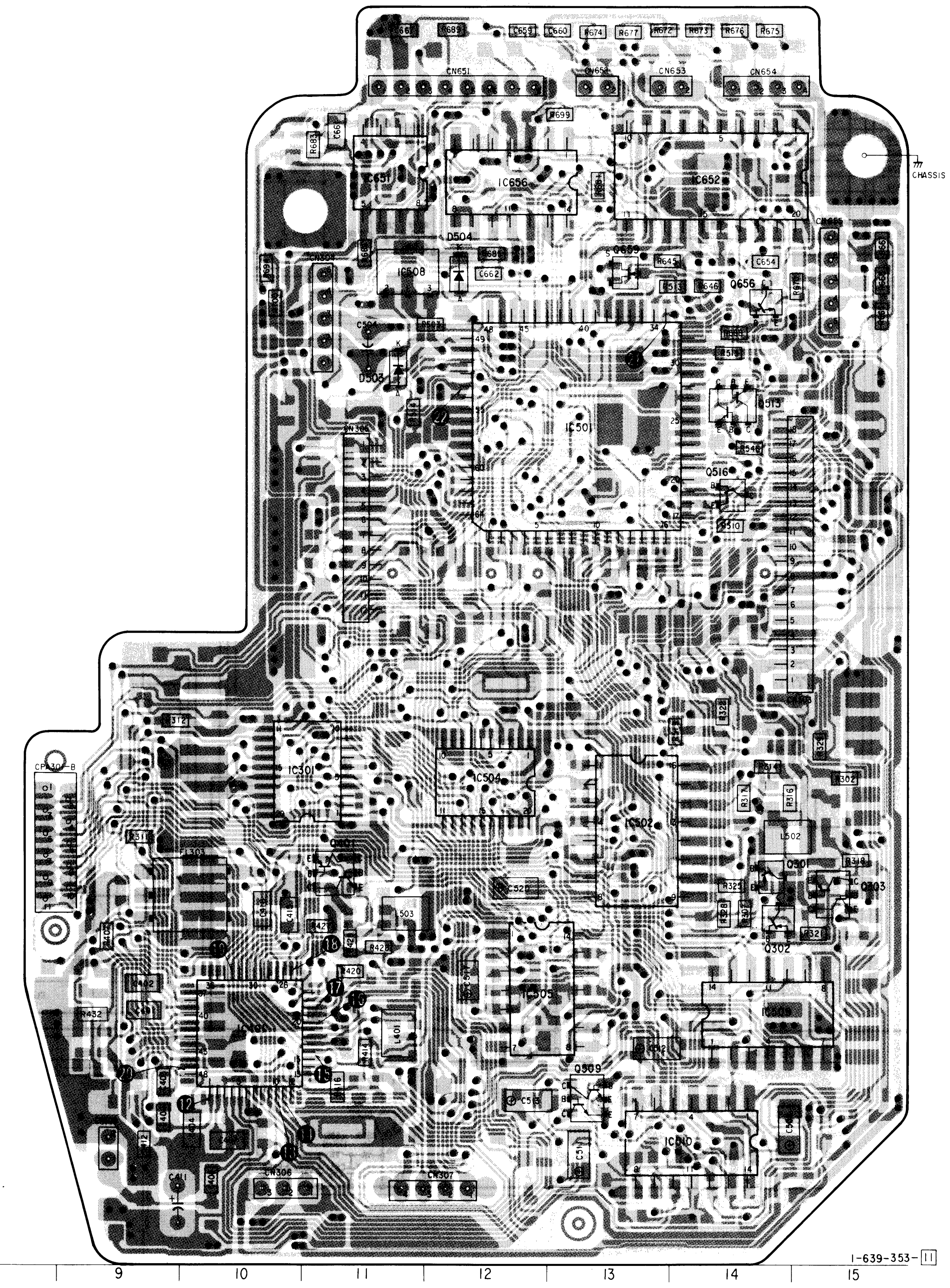
—Ref. No. CD-65 and VC-99 BOARDS : 1000 series—

VC-99 BOARD (COMPONENT SIDE)



A
B
C
D
E
F
G
H
I
J
CHASSIS
Q657
IC655
D600
D501
D502
IC508
CN301
Q504
Q515
Q514
Q507
Q510
CP430-A
04
1
2
3
4
5
6
7
8

VC-99 BOARD (CONDUCTOR SIDE)



CHASSIS
CN651
CN653
CN654
IC656
IC652
IC501
IC504
IC301
IC502
IC505
IC510
Q656
Q516
Q509
Q301
Q302
Q303
D503
D504
CP430-B
CN306
CN307
1-639-353-11
9
10
11
12
13
14
15

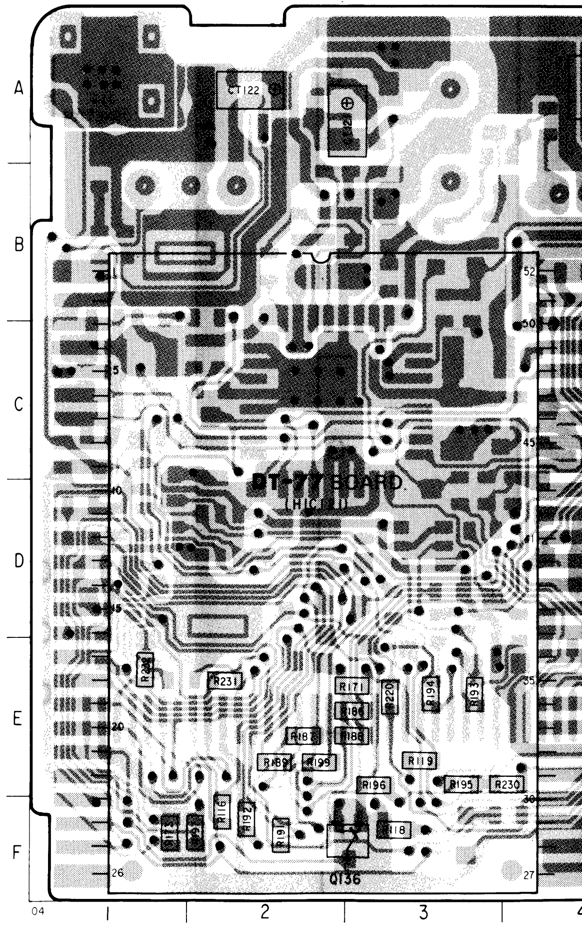
< DIODE >		
D501	8-719-404-46	MA110
D502	8-719-404-46	MA110
D503	8-719-404-46	MA110
D504	8-719-404-46	MA110
D600	8-719-420-90	MA8051-M

< IC >		
IC301	8-759-946-00	MB88341PFV
IC401	8-752-038-XX	CXA1392R
IC501	8-759-038-86	MC68HC11E9FU-SC400225
IC502	8-759-008-95	MC14028BF
IC504	8-759-635-27	M62352GP
IC505	8-759-998-96	LM324D
IC507	8-759-030-74	SC14S66F
IC508	8-759-937-56	S-8054ALB-S
IC509	8-759-509-05	XRU4066BF
IC510	8-759-998-96	LM324D

IC651	8-759-
IC652	8-759-
IC653	8-759-
IC656	8-759-

< TRANSISTOR >	
Q301	8-729-
Q302	8-729-
Q303	8-729-
Q401	8-729-
Q402	8-729-
Q403	8-729-
Q404	8-729-
Q502	8-729-
Q504	8-729-
Q505	8-729-
Q506	8-729-
Q507	8-729-
Q508	8-729-

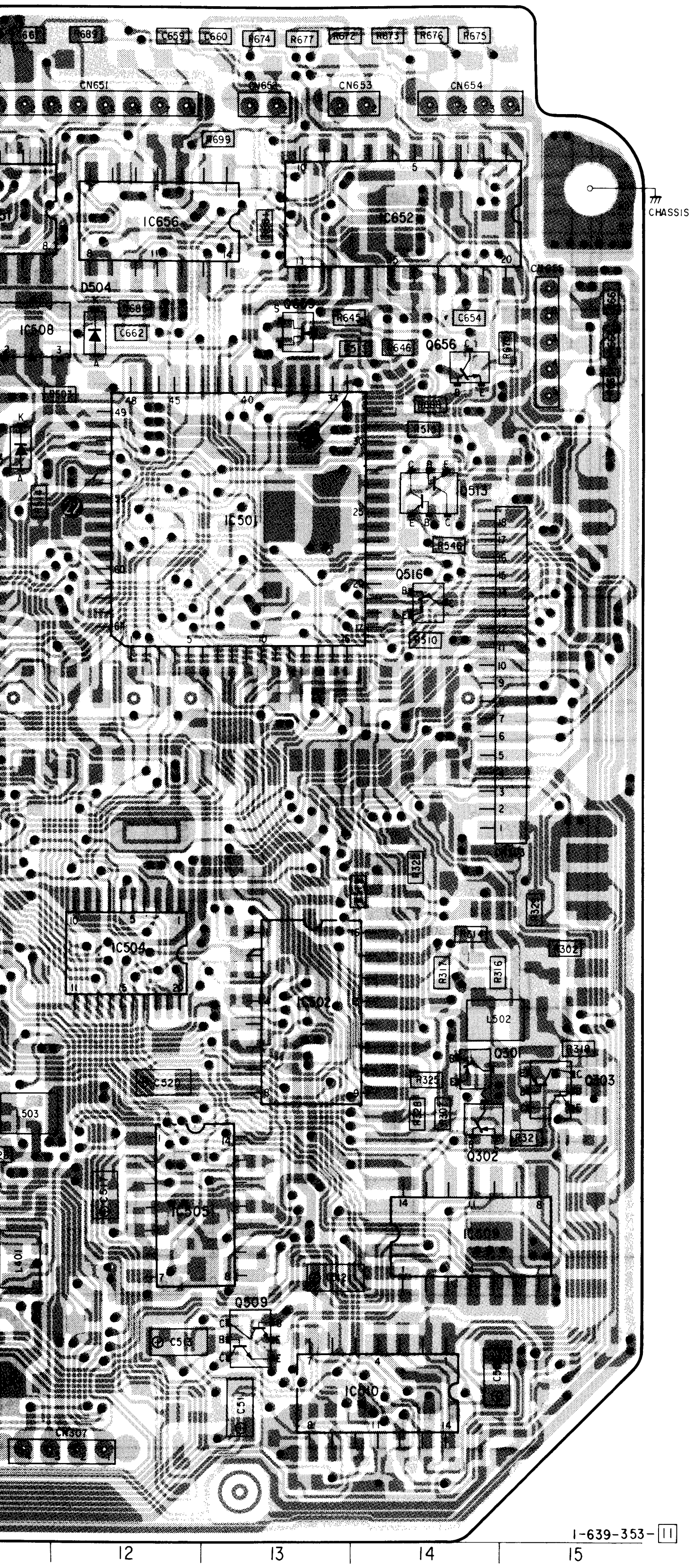
CD-65 BOARD (COMPONENT SIDE)



A
B
C
D
E
F
CT122
DT-77 BOARD
IC001
Q136
26
27
04
1
2
3

Be sure to always read "Precautions for replacement of CCD block" in page 93 when replacing the CD-65 board, complet board, complete and CCD imager block (IC101 on the CD-65 b IC001 on the DT-77 board).

-99 BOARD (CONDUCTOR SIDE)


CHASSIS
IC656
IC652
D504
IC508
Q656
IC501
Q513
Q516
Q510
IC504
IC502
L502
Q301
Q303
Q302
IC505
Q509
IC510
CN651
CN653
CN654
CN507
12
13
14
15
1-639-353-11

< DIODE >

D501	8-719-404-46	MA110
D502	8-719-404-46	MA110
D503	8-719-404-46	MA110
D504	8-719-404-46	MA110
D600	8-719-420-90	MA8051-M

< IC >

IC301	8-759-946-00	MB88341PFV
IC401	8-752-038-XX	CXA1392R
IC501	8-759-038-86	MC68HC11E9FU-SC400225
IC502	8-759-008-95	MC14028BF
IC504	8-759-635-27	M62352GP
IC505	8-759-998-96	LM324D
IC507	8-759-030-74	SC14S66F
IC508	8-759-937-56	S-8054ALB-S
IC509	8-759-509-05	XRU4066BF
IC510	8-759-998-96	LM324D
IC651	8-759-981-82	RC3414M
IC652	8-759-037-20	MPC1737M
IC653	8-759-998-98	LM358D
IC656	8-759-998-96	LM324D

< TRANSISTOR >

Q301	8-729-905-23	2SA1576-R
Q302	8-729-905-23	2SA1576-R
Q303	8-729-402-84	XN4601
Q401	8-729-402-84	XN4601
Q402	8-729-402-84	XN4601
Q403	8-729-905-23	2SA1576-R
Q404	8-729-905-35	2SC4081-R
Q502	8-729-420-50	UN5215
Q504	8-729-403-10	XN6215
Q505	8-729-403-10	XN6215
Q506	8-729-420-07	XN6213
Q507	8-729-420-50	UN5215
Q508	8-729-402-78	XN6401
Q509	8-729-403-10	XN6215
Q510	8-729-905-35	2SC4081-R
Q513	8-729-402-84	XN4601
Q514	8-729-905-35	2SC4081-R
Q515	8-729-402-84	XN4601
Q516	8-729-905-35	2SC4081-R
Q651	8-729-905-23	2SA1576-R
Q653	8-729-106-60	2SB1115A
Q654	8-729-905-35	2SC4081-R
Q655	8-729-905-35	2SC4081-R
Q656	8-729-905-35	2SC4081-R
Q657	8-729-402-84	XN4601
Q658	8-729-402-84	XN4601
Q659	8-729-821-88	2SK1332-3

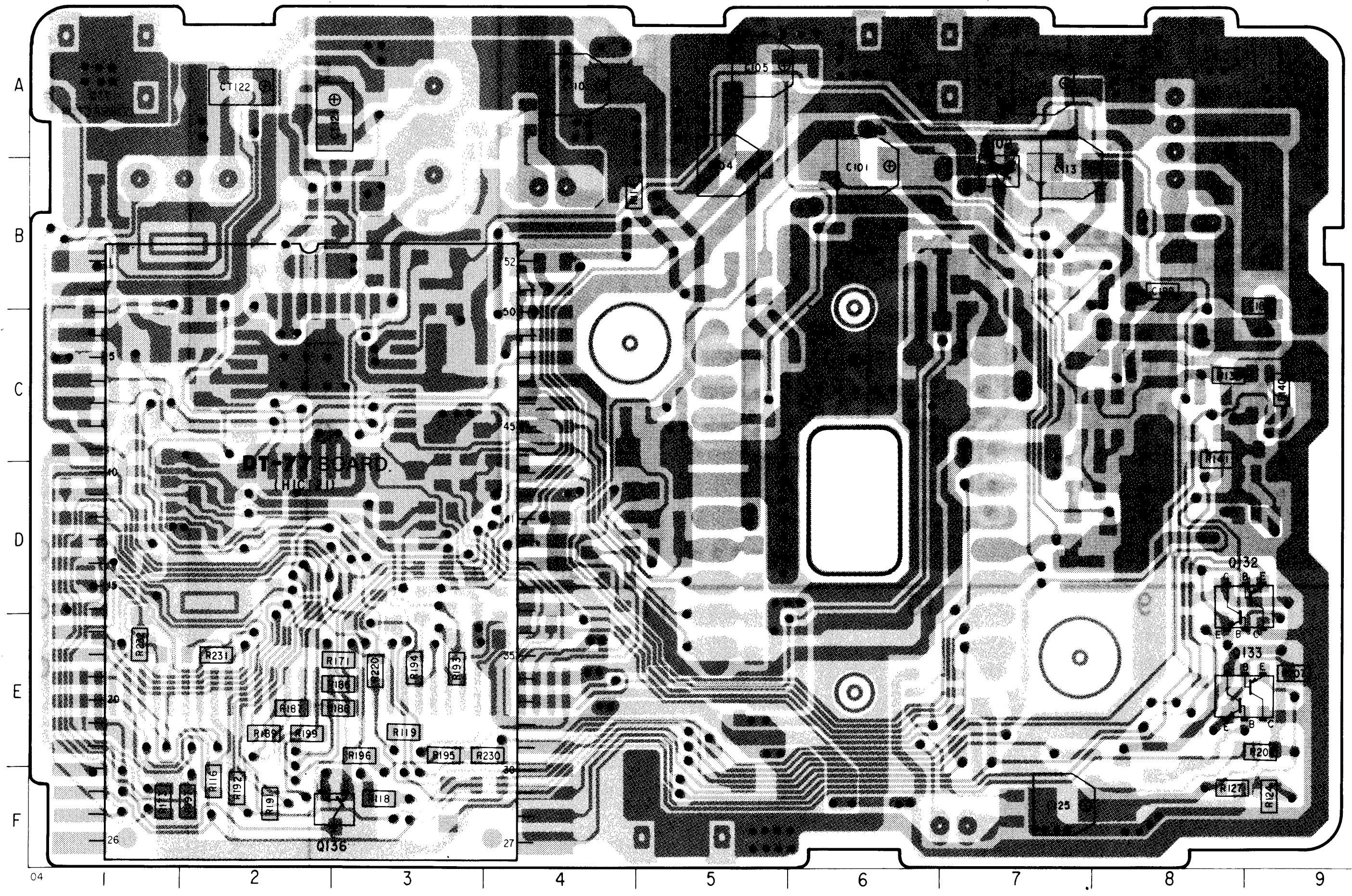
< DIODE >

D101	8-719-404-46	MA110
D102	8-719-404-52	MA143
D122	8-719-404-32	MA141WA
D123	8-719-404-46	MA110
D124	8-719-404-32	MA141WA
D125	8-719-949-46	1T32
D128	8-719-404-46	MA110

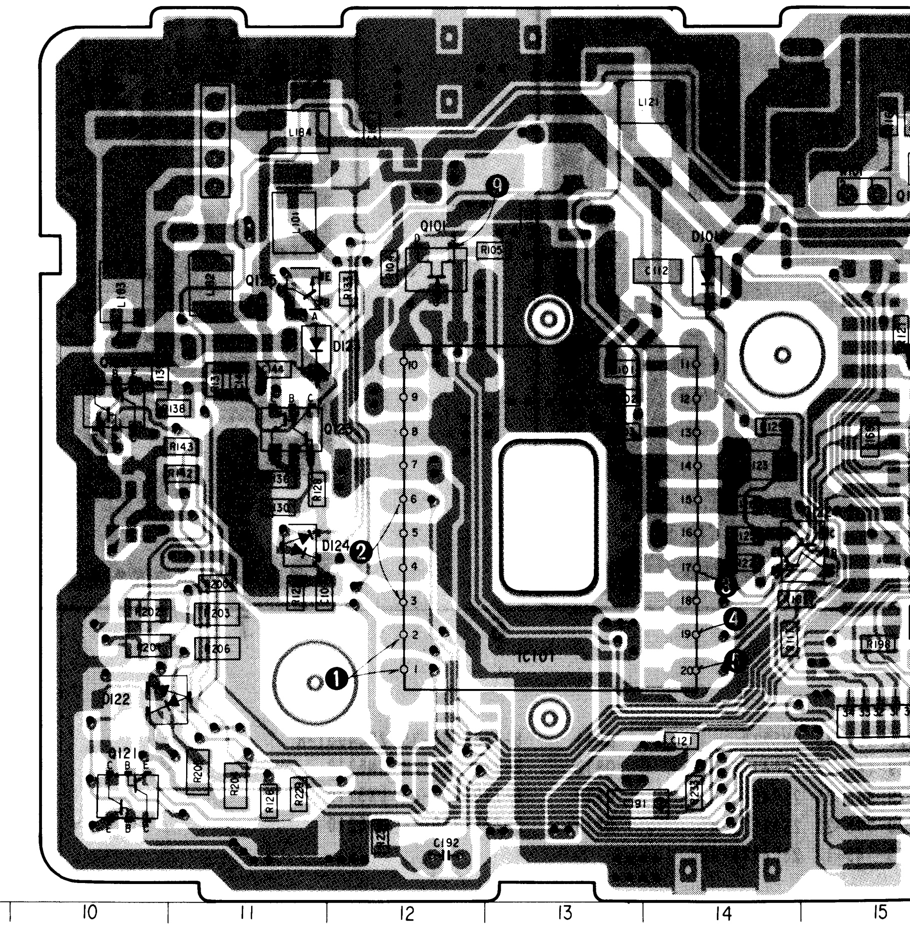
< IC >

IC121	8-752-326-08	CXD1159Q

CD-65 BOARD (COMPONENT SIDE)


A
B
C
D
E
F
DT-77 BOARD
C101
Q132
Q133
Q136
04
1
2
3
4
5
6
7
8
9

CD-65 BOARD (CONDUCTOR SIDE)


Q101
D101
IC101
D124
D122
Q121
Q125
Q122
C192
L121
10
11
12
13
14
15

Be sure to always read "Precautions for replacement of CCD imager block" in page 93 when replacing the CD-65 board, complete, DT-77 board, complete and CCD imager block (IC101 on the CD-65 board and IC001 on the DT-77 board).

-729-403-10 XN6215
-729-905-35 2SC4081-R

-729-402-84 XN4601
-729-905-35 2SC4081-R
-729-402-84 XN4601
-729-905-35 2SC4081-R
-729-905-23 2SA1576-R

-729-106-60 2SB1115A
-729-905-35 2SC4081-R
-729-905-35 2SC4081-R
-729-905-35 2SC4081-R
-729-402-84 XN4601

-729-402-84 XN4601
-729-821-88 2SK1332-3

< DIODE >

D101	8-719-404-46	MA110
D102	8-719-404-52	MA143
D122	8-719-404-32	MA141WA
D123	8-719-404-46	MA110
D124	8-719-404-32	MA141WA
D125	8-719-949-46	1T32
D128	8-719-404-46	MA110

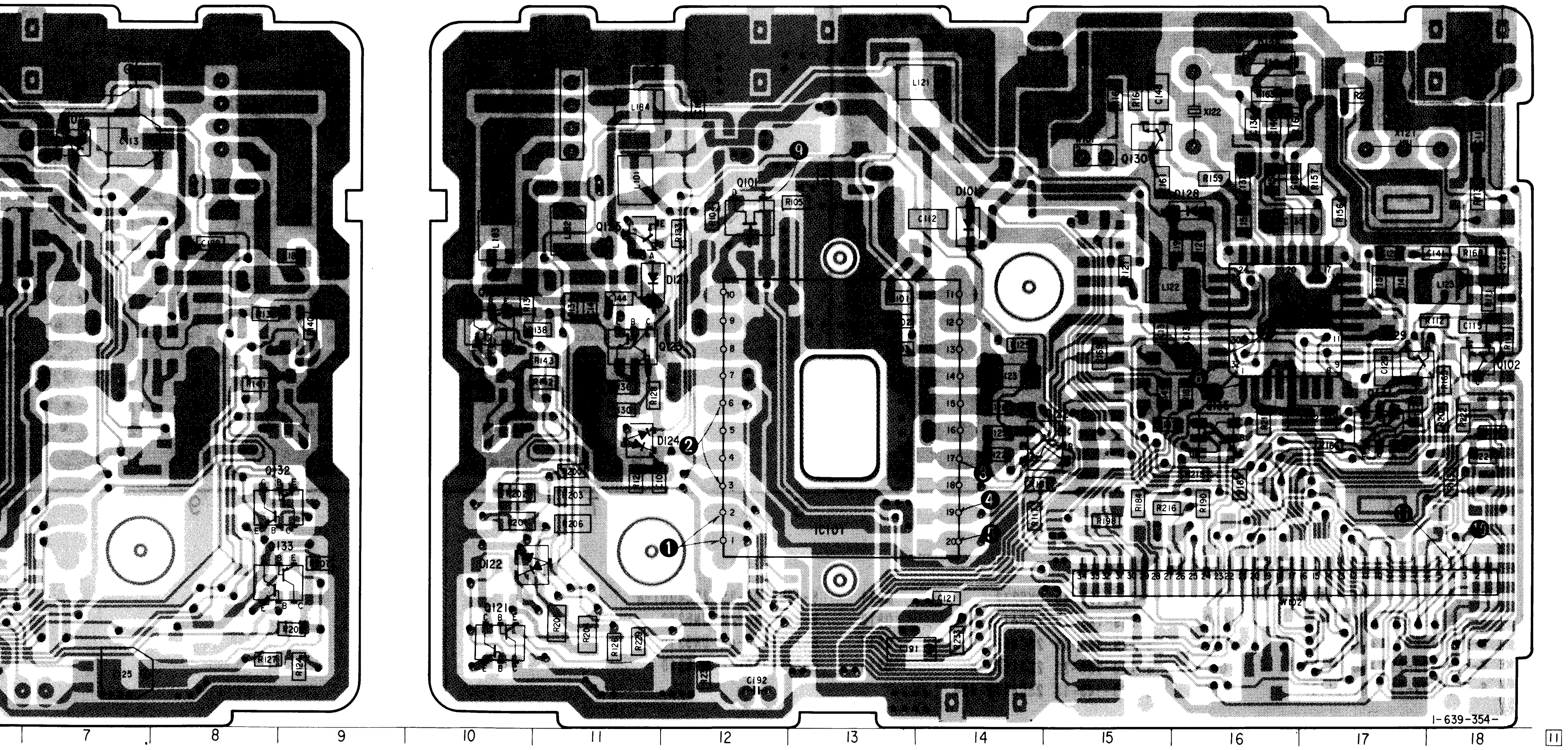
< IC >

IC121	8-752-326-08	CXD1159Q

< TRANSISTOR >

Q101	8-765-420-02	2SK300-3
Q102	8-729-905-35	2SC4081-R
Q121	8-729-402-84	XN4601
Q122	8-729-402-78	XN6401
Q123	8-729-402-19	XN6501
Q125	8-729-905-35	2SC4081-R
Q126	8-729-402-84	XN4601
Q129	8-729-905-23	2SA1576-R
Q130	8-729-905-35	2SC4081-R
Q131	8-729-402-84	XN4601
Q132	8-729-402-84	XN4601
Q133	8-729-402-84	XN4601
Q135	8-729-402-84	XN4601
Q136	8-729-402-45	UN5212

CD-65 BOARD (CONDUCTOR SIDE)


IC101
Q101
Q102
Q121
Q122
Q123
Q125
Q126
Q129
Q130
Q132
Q133
D101
D122
D124
D128
W102
1-639-354-
7
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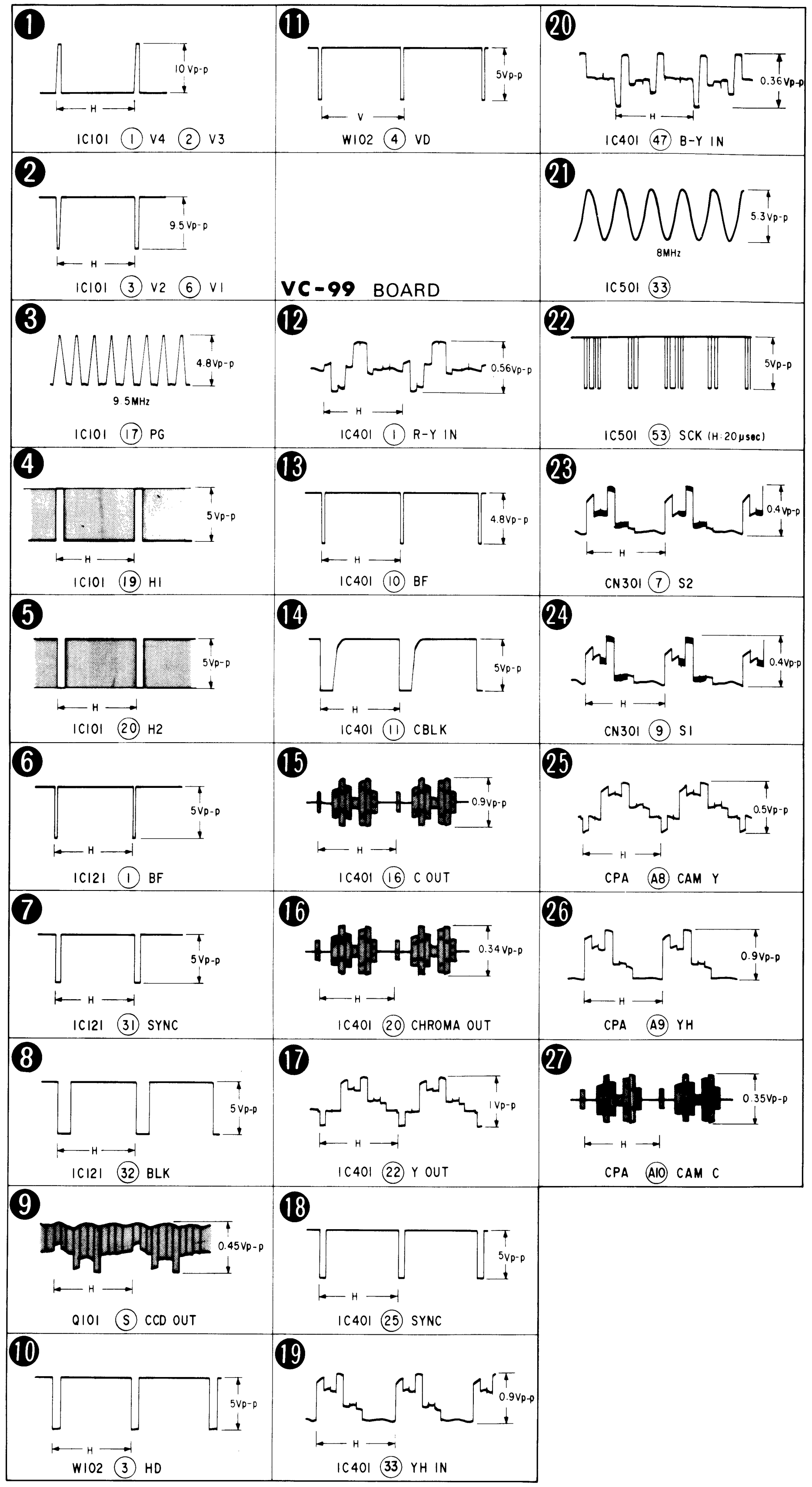
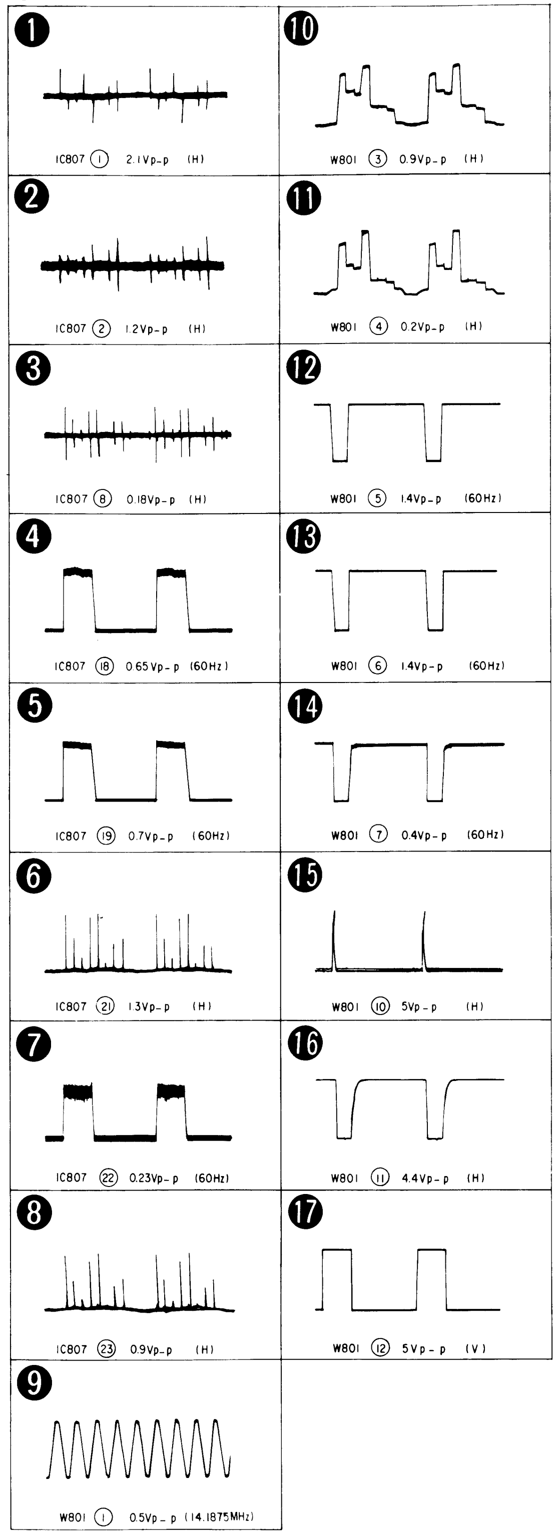
18
11

CD-65 BOARD

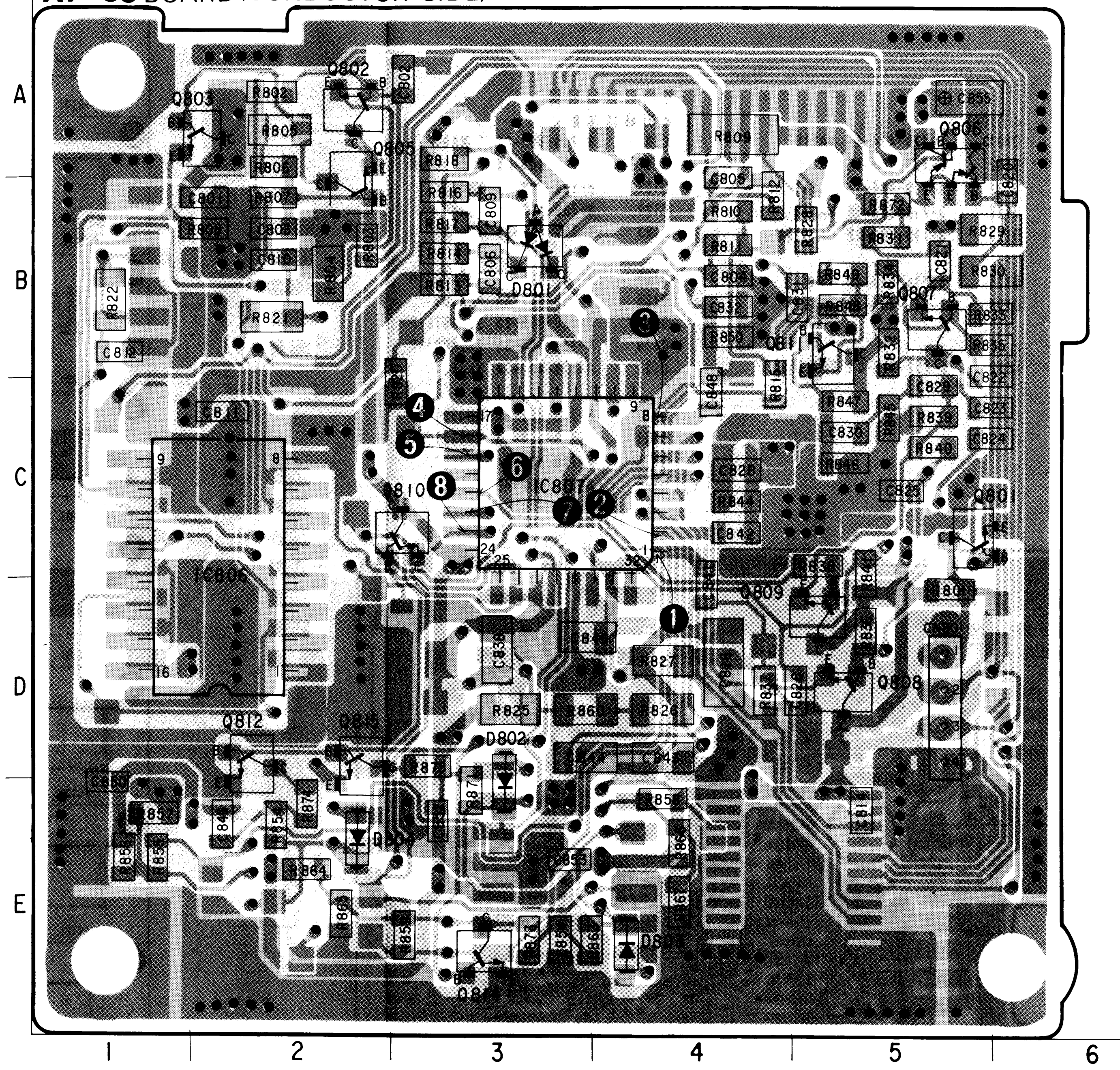

❶ 10Vp-p H IC101 ① V4 ② V3
❷ 9.5Vp-p H IC101 ③ V2 ⑥ V1
❸ 4.8Vp-p 9.5MHz IC101 ⑰ PG
❹ 5Vp-p H IC101 ⑲ H1
❺ 5Vp-p H IC101 ⑳ H2
❻ 5Vp-p H IC121 ① BF
❼ 5Vp-p H IC121 ㉛ SYNC
❽ 5Vp-p H IC121 ㉜ BLK
❾ 0.45Vp-p H Q101 Ⓢ CCD OUT
❿ 5Vp-p H W102 ③ HD
⓫ 5Vp-p V W102 ④ VD
VC-99 BOARD
⓬ 0.56Vp-p H IC401 ① R-Y IN
⓭ 4.8Vp-p H IC401 ⑩ BF
⓮ 5Vp-p H IC401 ⑪ CBLK
⓯ 0.9Vp-p H IC401 ⑯ C OUT
⓰ 0.34Vp-p H IC401 ⑳ CHROMA OUT
⓱ 1Vp-p H IC401 ㉒ Y OUT
⓲ 5Vp-p H IC401 ㉕ SYNC
⓳ 0.9Vp-p H IC401 ㉝ YH IN
⓴ 0.36Vp-p H IC401 (47) B-Y IN
㉑ 5.3Vp-p 8MHz IC501 ㉝
㉒ 5Vp-p IC501 (53) SCK (H:20μsec)
㉓ 0.4Vp-p H CN301 ⑦ S2
㉔ 0.4Vp-p H CN301 ⑨ S1
㉕ 0.5Vp-p H CPA Ⓐ8 CAM Y
㉖ 0.9Vp-p H CPA Ⓐ9 YH
㉗ 0.35Vp-p H CPA Ⓐ10 CAM C

AF-86 (AUTO FOCUS) PRINTED WIRING BOARD
—Ref. No. AF-86 BOARD : 1000 series—

AF-86 BOARD

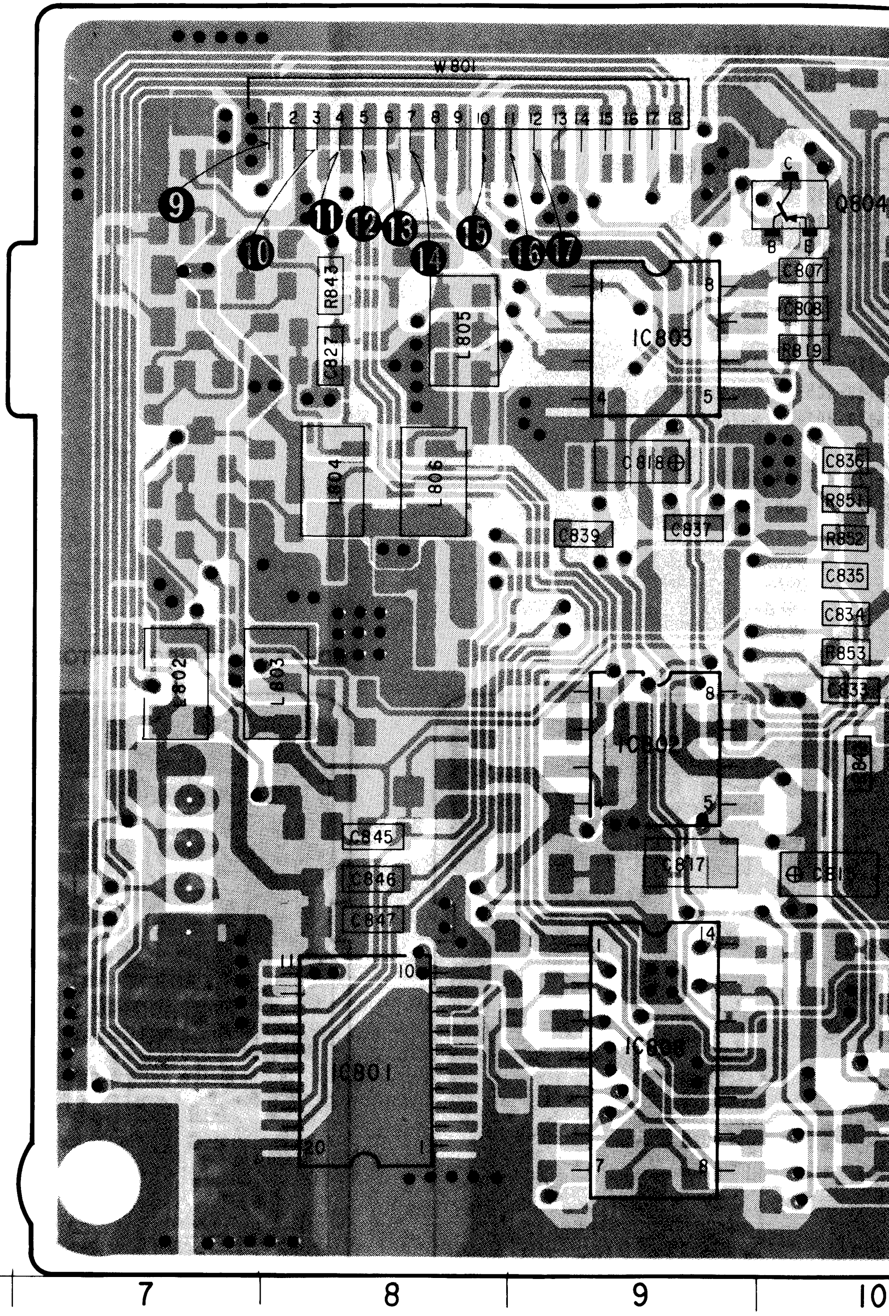


AF-86 BOARD (CONDUCTOR SIDE)



A
B
C
D
E
1
2
3
4
5
6
IC801
IC806
IC807
Q801
Q802
Q803
Q805
Q806
Q807
Q808
Q809
Q810
Q811
Q812
Q814
Q815
D801
D802
D803
D804
CN801

AF-86 BOARD (COMPONENT SIDE)



W801
7
8
9
10
IC801
IC802
IC803
IC808
Q804
L804
L805
L806

04

< DIODE >

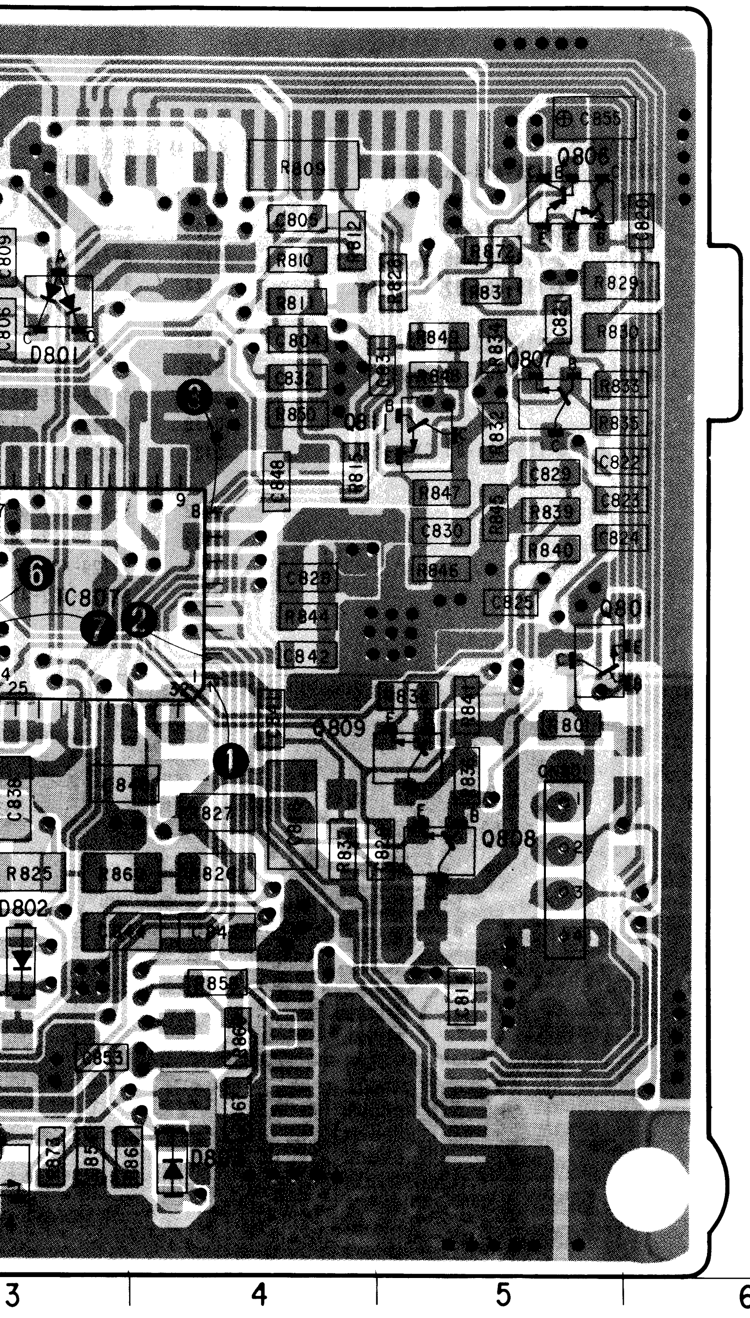
D801	8-719-404-32	MA141WA
D802	8-719-404-46	MA110
D803	8-719-404-46	MA110
D804	8-719-404-46	MA110

< IC >

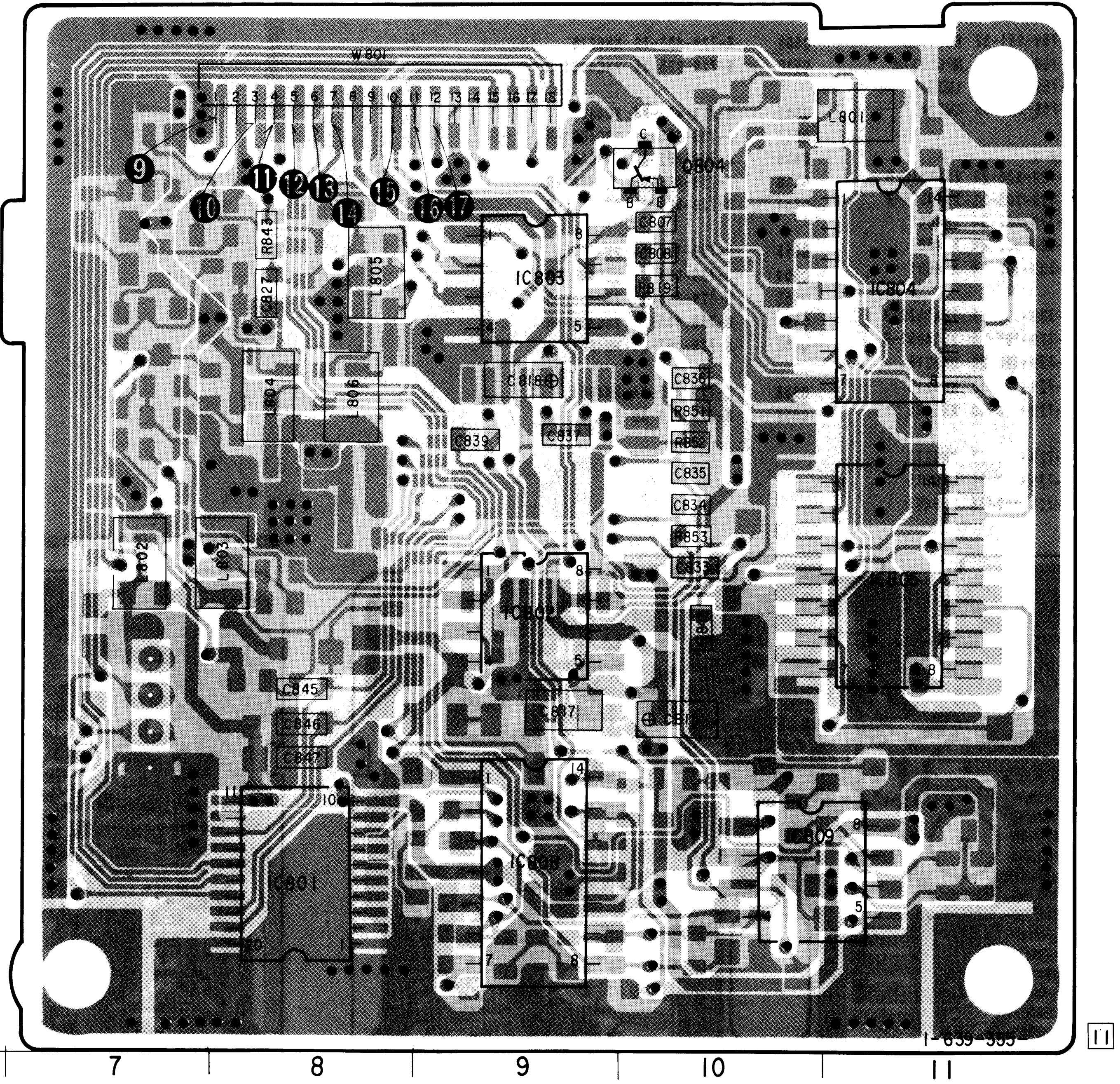
IC801	8-759-946-00	MB88341PFV
IC802	8-759-998-98	LM358D
IC803	8-759-100-93	uPC393G2
IC804	8-759-509-29	XRU4011BF
IC805	8-759-509-29	XRU4011BF
IC806	8-759-926-98	SN74HC4040NS
IC807	8-752-055-56	CXA1516Q
IC808	8-759-998-96	LM324DR
IC809	8-759-998-98	LM358DR

< TRANSISTOR >

Q801	8-729-402-45	UN5212
Q802	8-729-143-13	2SC4176-B34
Q803	8-729-905-35	2SC4081-R
Q804	8-729-905-23	2SA1576-R
Q805	8-729-143-13	2SC4176-B34
Q806	8-729-402-78	XN6401
Q807	8-729-905-35	2SC4081-R
Q808	8-729-905-35	2SC4081-R
Q809	8-729-905-35	2SC4081-R
Q810	8-729-905-35	2SC4081-R
Q811	8-729-905-35	2SC4081-R
Q812	8-729-420-44	UN5210
Q814	8-729-420-44	UN5210
Q815	8-729-420-44	UN5210


R809
C850
Q806
D801
R810
R811
R812
R826
R831
R829
R830
Q807
Q811
R847
C839
C823
R839
R840
R845
C829
R844
R842
C825
Q801
Q809
Q808
IC801
R825
D802
C827
R855
C853
R873
3
4
5
6

AF-86 BOARD (COMPONENT SIDE)


W801
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
9
10
11
12
13
14
15
16
17
R843
C827
L805
IC803
Q804
C807
C808
C819
L801
IC804
L804
L806
C818
C836
R854
R852
C835
C834
R853
C839
C837
L802
L803
IC802
C845
C846
C847
C817
IC801
IC808
IC809
1-639-355-
11
7
8
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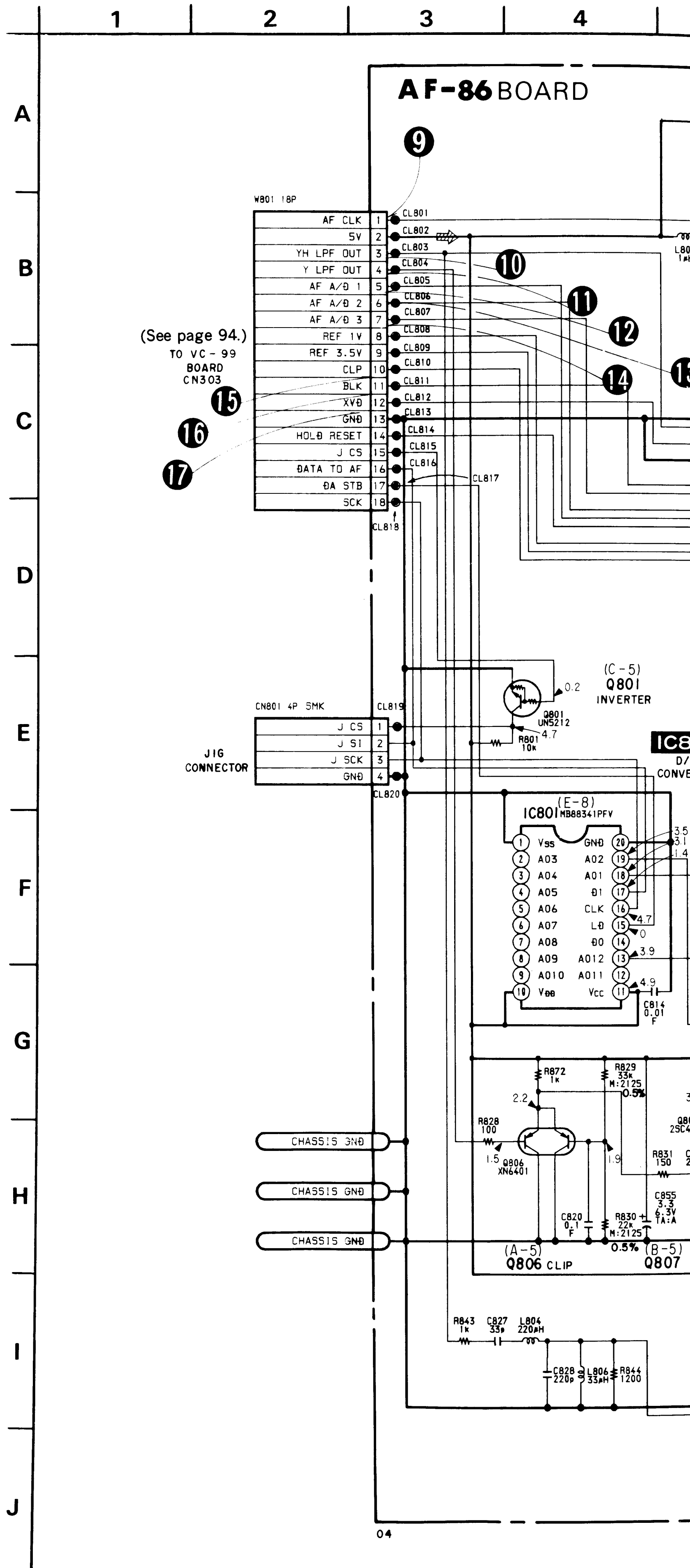
10
11

		< TRANSISTOR >			
00 MB88341PFV	Q801	8-729-402-45 UN5212	Q811	8-729-905-35 2SC4081-R	
98 LM358D	Q802	8-729-143-13 2SC4176-B34	Q812	8-729-420-44 UN5210	
93 uPC393G2	Q803	8-729-905-35 2SC4081-R	Q814	8-729-420-44 UN5210	
29 XRU4011BF	Q804	8-729-905-23 2SA1576-R	Q815	8-729-420-44 UN5210	
29 XRU4011BF	Q805	8-729-143-13 2SC4176-B34			
98 SN74HC4040NS	Q806	8-729-402-78 XN6401			
56 CXA1516Q	Q807	8-729-905-35 2SC4081-R			
96 LM324DR	Q808	8-729-905-35 2SC4081-R			
98 LM358DR	Q809	8-729-905-35 2SC4081-R			
	Q810	8-729-905-35 2SC4081-R			

CAMERA (2) **CAMERA (2)**

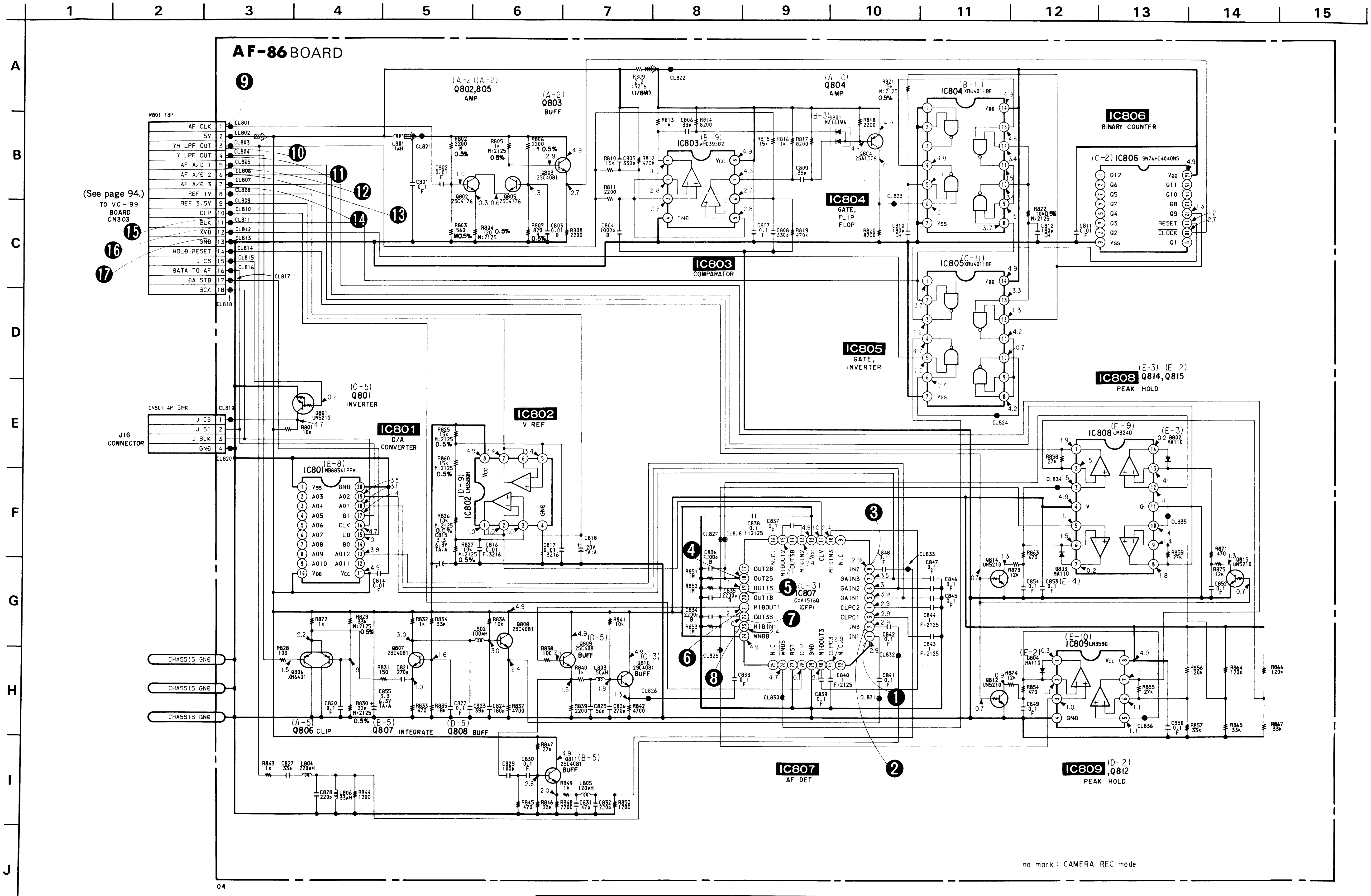
AF-86 (AUTO FOCUS) SCHEMATIC DIAGRAM

—Ref. No. AF-86 BOARD : 1000 series—


1
2
3
4
A
B
C
D
E
F
G
H
I
J
AF-86 BOARD
9
W801 18P
AF CLK
5V
YH LPF OUT
Y LPF OUT
AF A/D 1
AF A/D 2
AF A/D 3
REF 1V
REF 3.5V
CLP
BLK
XVD
GND
HOLD RESET
J CS
DATA TO AF
DA STB
SCK
CL801
CL802
CL803
CL804
CL805
CL806
CL807
CL808
CL809
CL810
CL811
CL812
CL813
CL814
CL815
CL816
CL817
CL818
10
11
12
13
14
15
16
17
(See page 94.)
TO VC-99
BOARD
CN303
(C-5)
Q801
INVERTER
Q801
UN5212
R801
10k
CN801 4P SMK
CL819
J CS
J SI
J SCK
GND
JIG
CONNECTOR
CL820
IC801 (E-8)
MB88341PFV
Vss
AO3
AO4
AO5
AO6
AO7
AO8
AO9
AO10
VBB
GND
AO2
AO1
DI
CLK
LD
DO
AO12
AO11
Vcc
C814
0.01
R872
1k
R829
33k
M:2125
0.5%
R828
100
Q806
XN6401
CHASSIS GND
CHASSIS GND
CHASSIS GND
C820
0.1
F
R830
22k
M:2125
0.5%
C855
3.3
6.3V
TA:A
R831
150
(A-5)
Q806 CLIP
(B-5)
Q807
R843
1k
C827
33p
L804
220μH
C828
220p
L806
33μH
R844
1200
04

AF-86 (AUTO FOCUS) SCHEMATIC DIAGRAM

—Ref. No. AF-86 BOARD: 1000 series—


1
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11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
AF-86 BOARD
WB01 18P
AF CLK
5V
YH LPF OUT
Y LPF OUT
AF A/D 1
AF A/D 2
AF A/D 3
REF 1V
REF 3.5V
CLP
BLK
XVD
GND
HOLD RESET
J CS
DATA TO AF
DA STB
SCK
(See page 94.)
TO VC-99
BOARD
CN303
CN801 4P 5MK
J CS
J SI
J SCK
GND
JIG
CONNECTOR
CHASSIS GND
CHASSIS GND
CHASSIS GND
(A-2)(A-2)
Q802,805
AMP
(A-2)
Q803
BUFF
(A-10)
Q804
AMP
IC803
COMPARATOR
IC804
GATE, FLIP FLOP
IC805
GATE, INVERTER
IC806
BINARY COUNTER
(C-2) IC806 SN74HC4040NS
(E-3) (E-2)
IC808 Q814,Q815
PEAK HOLD
(E-9)
IC808 LM324D
(C-5)
Q801
INVERTER
IC801
D/A
CONVERTER
(E-8)
IC801 MB88341PFV
IC802
V REF
(D-9)
IC802 LM358M
(C-3)
IC807 CXA1516Q (QFP)
(E-10)
IC809 LM358M
(A-5)
Q806 CLIP
(B-5)
Q807 INTEGRATE
(D-5)
Q808 BUFF
(D-5)
Q809 2SC4081 BUFF
(C-3)
Q810 2SC4081 BUFF
Q811 (B-5) 2SC4081 BUFF
IC807
AF DET
IC809 (D-2) ,Q812
PEAK HOLD
no mark : CAMERA REC mode
04

< DIODE >

D901	8-719-949-46	1T32
D903	8-719-404-46	MA110
D904	8-719-404-46	MA110
D905	8-719-404-46	MA110
D906	8-719-404-46	MA110

< IC >

IC701	8-759-998-30	CF79028PG
IC702	8-759-979-96	MB8464A-15LLPF
IC703	8-752-039-49	CXA1393AN
IC704	8-759-634-47	M51285BGP
IC707	8-759-710-29	NJM2235M
IC708	8-759-710-09	NJM2233AM
IC709	8-759-710-09	NJM2233AM
IC713	8-759-234-20	TC7S08F
IC901	8-759-970-80	MB673198U
IC902	8-759-153-41	uPD6451AGT-611-E1

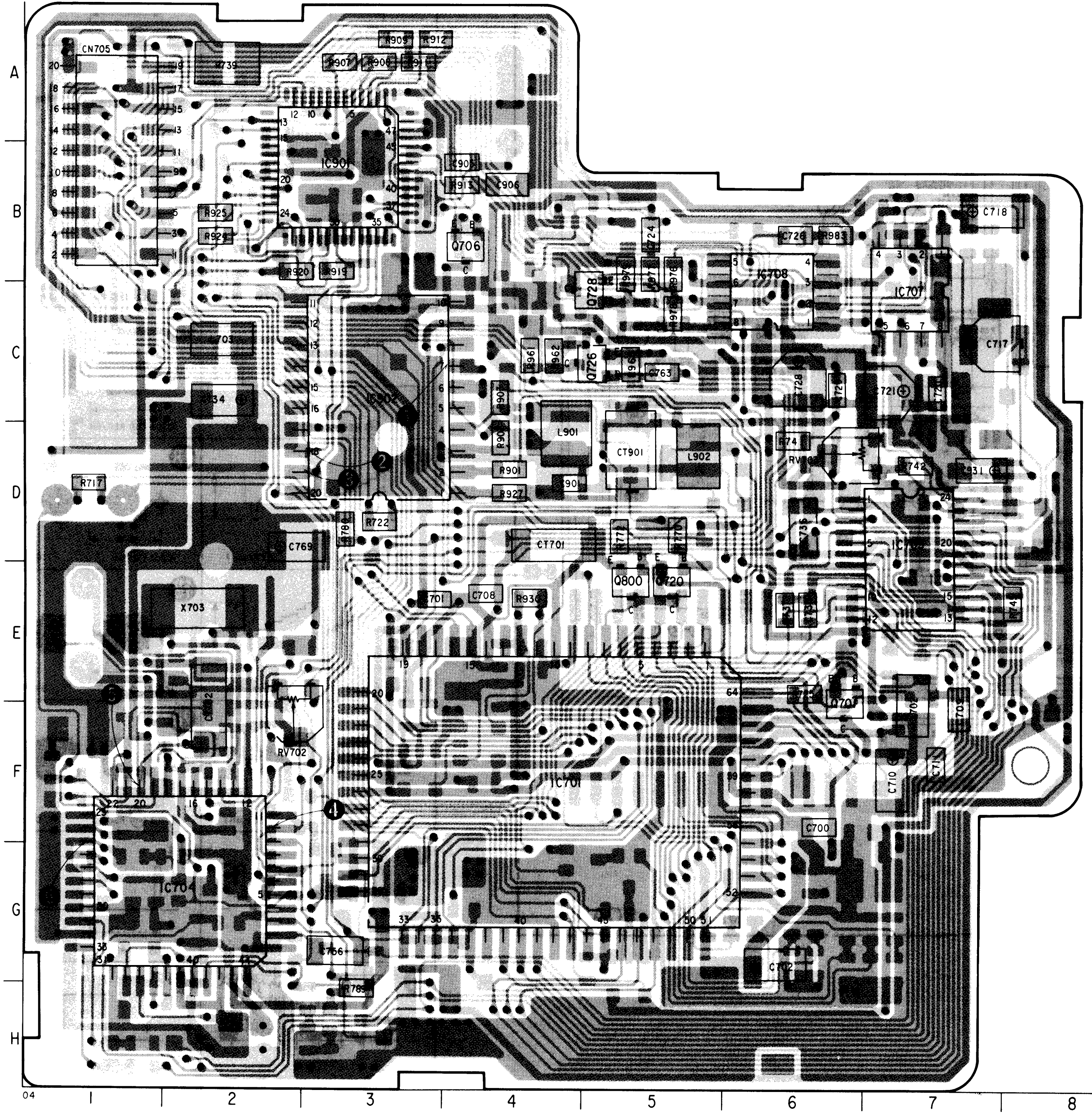
< TRANSISTOR >

Q701	8-729-925-91	DTC115EU
Q702	8-729-907-03	FMG5
Q703	8-729-905-18	DTC144EU
Q704	8-729-905-35	2SC4081-R
Q705	8-729-905-24	2SA1576-S
Q706	8-729-905-18	DTC144EU
Q707	8-729-905-35	2SC4081-R
Q708	8-729-905-15	DTC144WU
Q709	8-729-402-32	2SD1819A-R
Q709	8-729-905-35	2SC4081-R
Q710	8-729-905-35	2SC4081-R
Q720	8-729-905-18	DTC144EU
Q726	8-729-905-23	2SA1576-R
Q727	8-729-905-35	2SC4081-R
Q728	8-729-905-35	2SC4081-R
Q729	8-729-905-18	DTC144EU
Q730	8-729-905-12	DTA144EU
Q800	8-729-905-18	DTC144EU
Q801	8-729-905-23	2SA1576-R

CT-38 (DIGITAL TITLER, CHARACTER GENERATOR) PRINTED WIRING BOARD

—Ref. No. CT-38 BOARD : 2000 series—

CT-38 BOARD (COMPONENT SIDE)



A
B
C
D
E
F
G
H
CN705
IC901
IC902
IC701
IC704
X703
Q706
Q728
Q726
IC708
IC707
C717
C718
L901
CT901
L902
CT701
Q800
Q720
RV702
C769
R717
C700
C710
04
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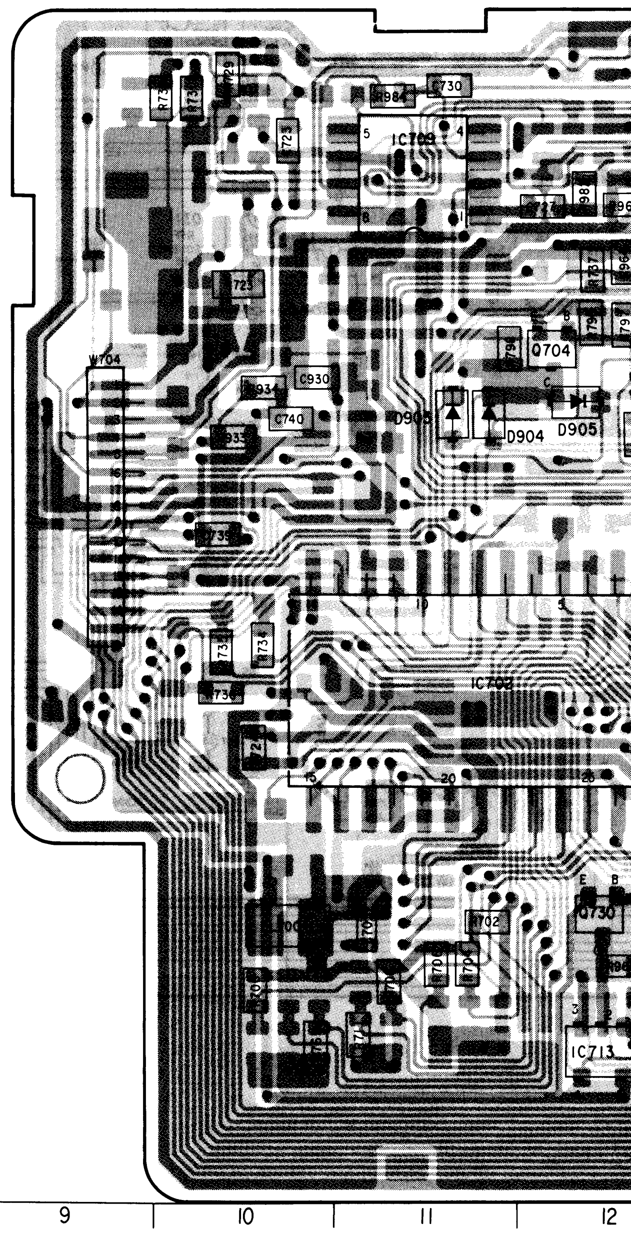
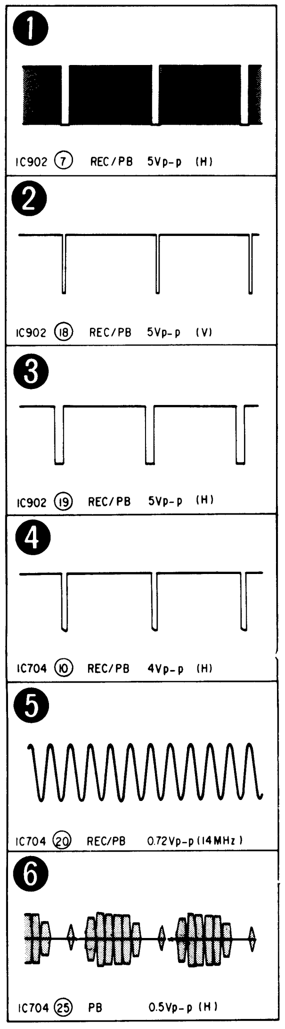
8

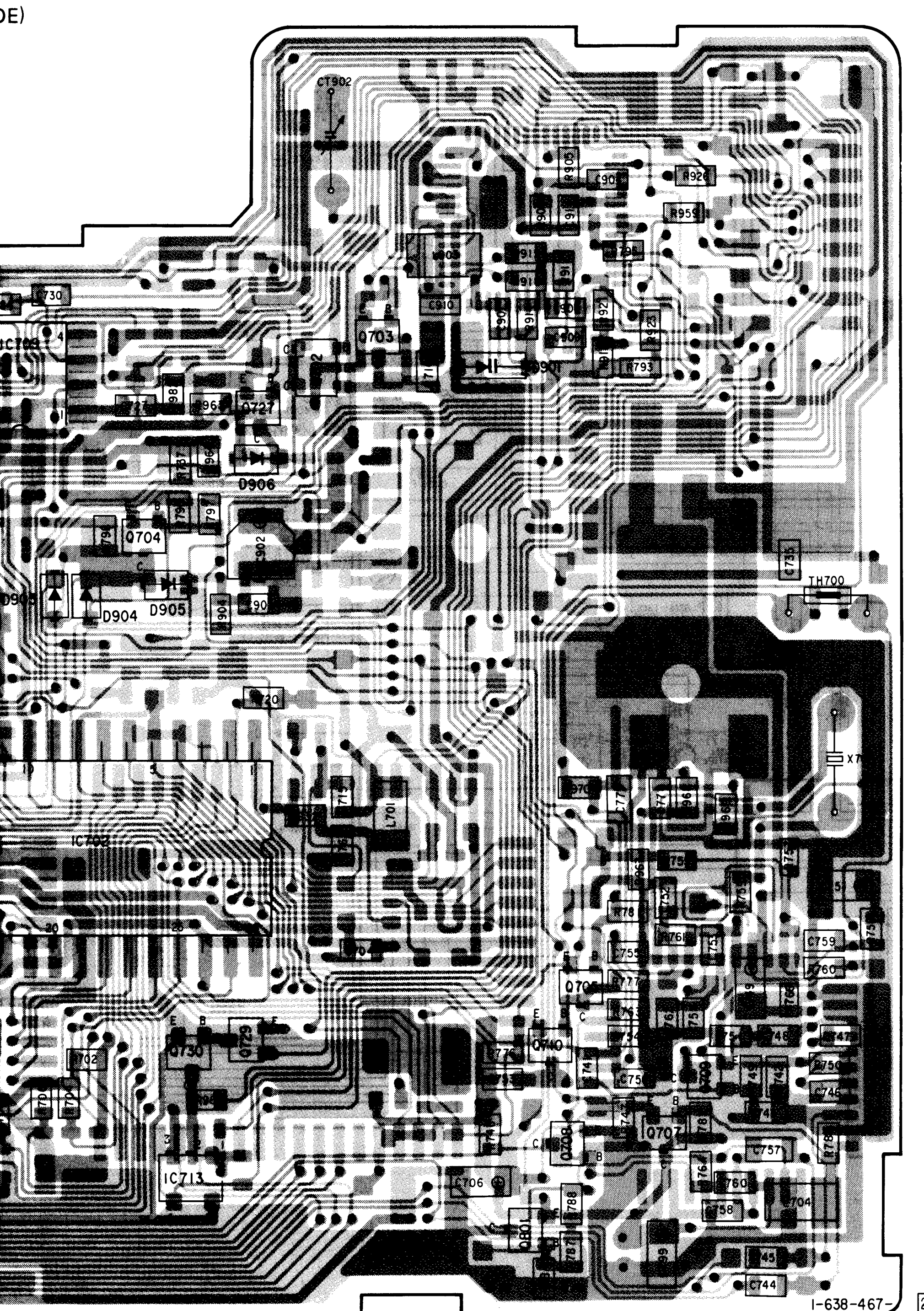
CT-38 BOARD (CONDUCTOR SIDE)



W704
IC709
Q704
D904
D905
D906
IC702
Q730
IC713
9
10
11
12



DE)


CT902
IC702
IC713
D904
D905
D906
Q703
Q704
Q705
Q707
Q710
TH700
X7
L701
C735
C744
C757
C759
C760
1-638-467-
21
11
12
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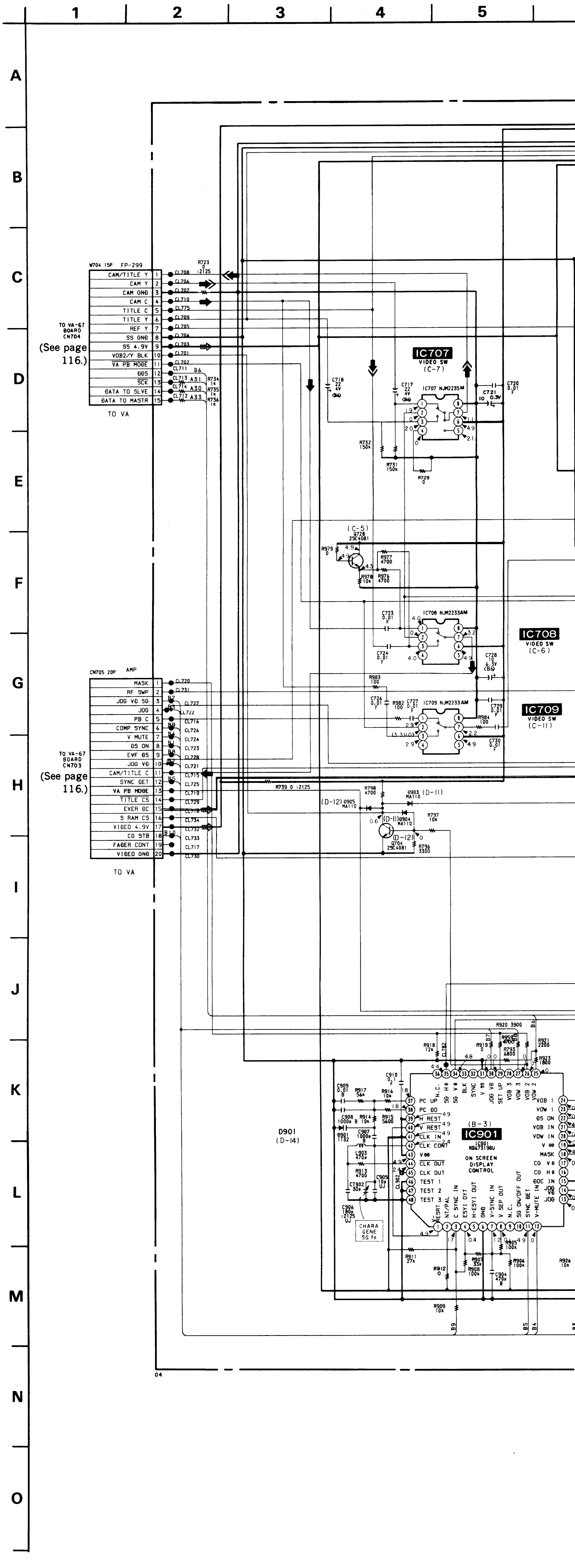
14
15
16

CT-38 (DIGITAL TITLER, CHARACTER GENERATOR) SCHEMATIC DIAGRAM

—Ref. No. CT-38 BOARD : 2000 series—


1
2
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5
A
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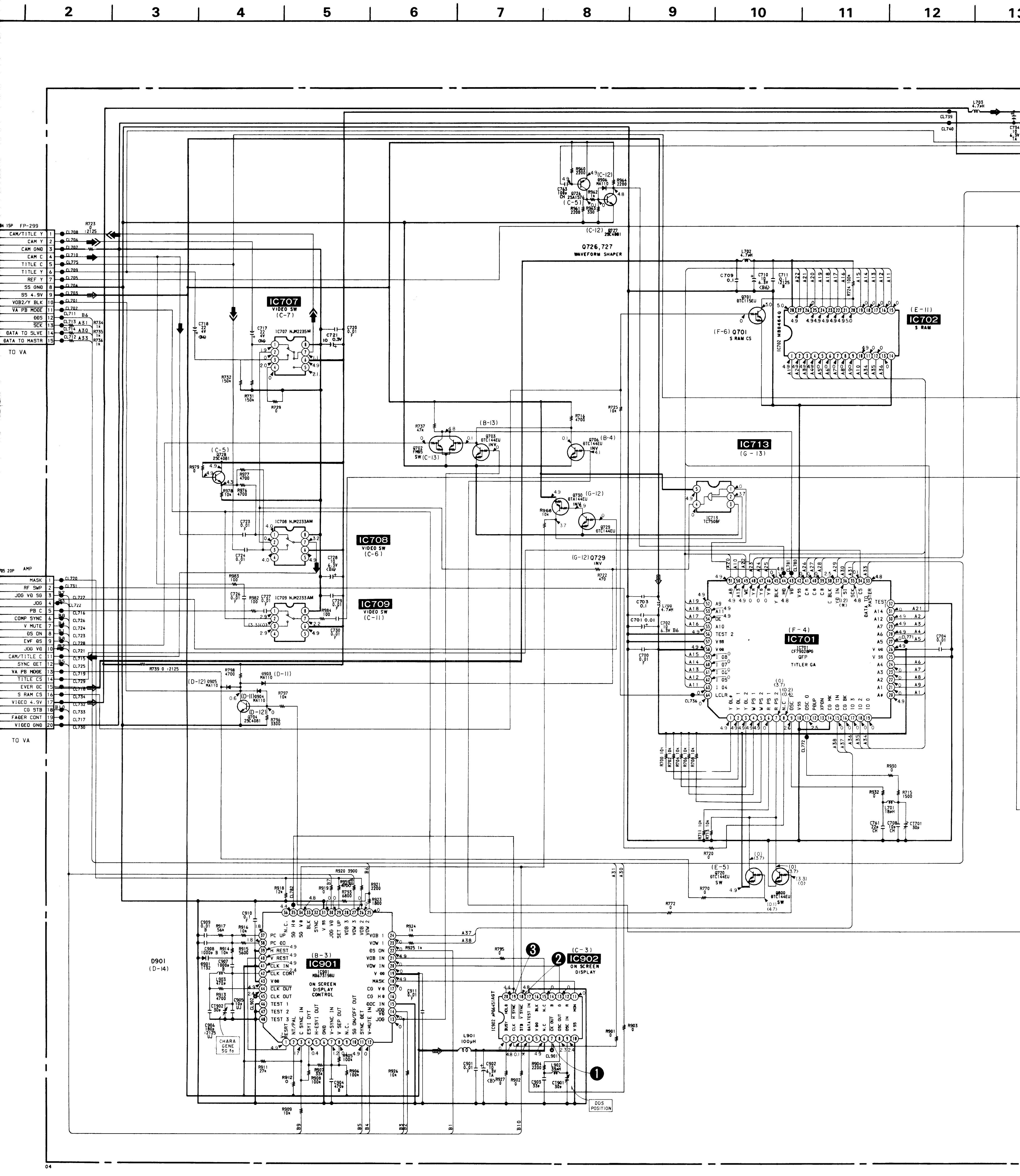
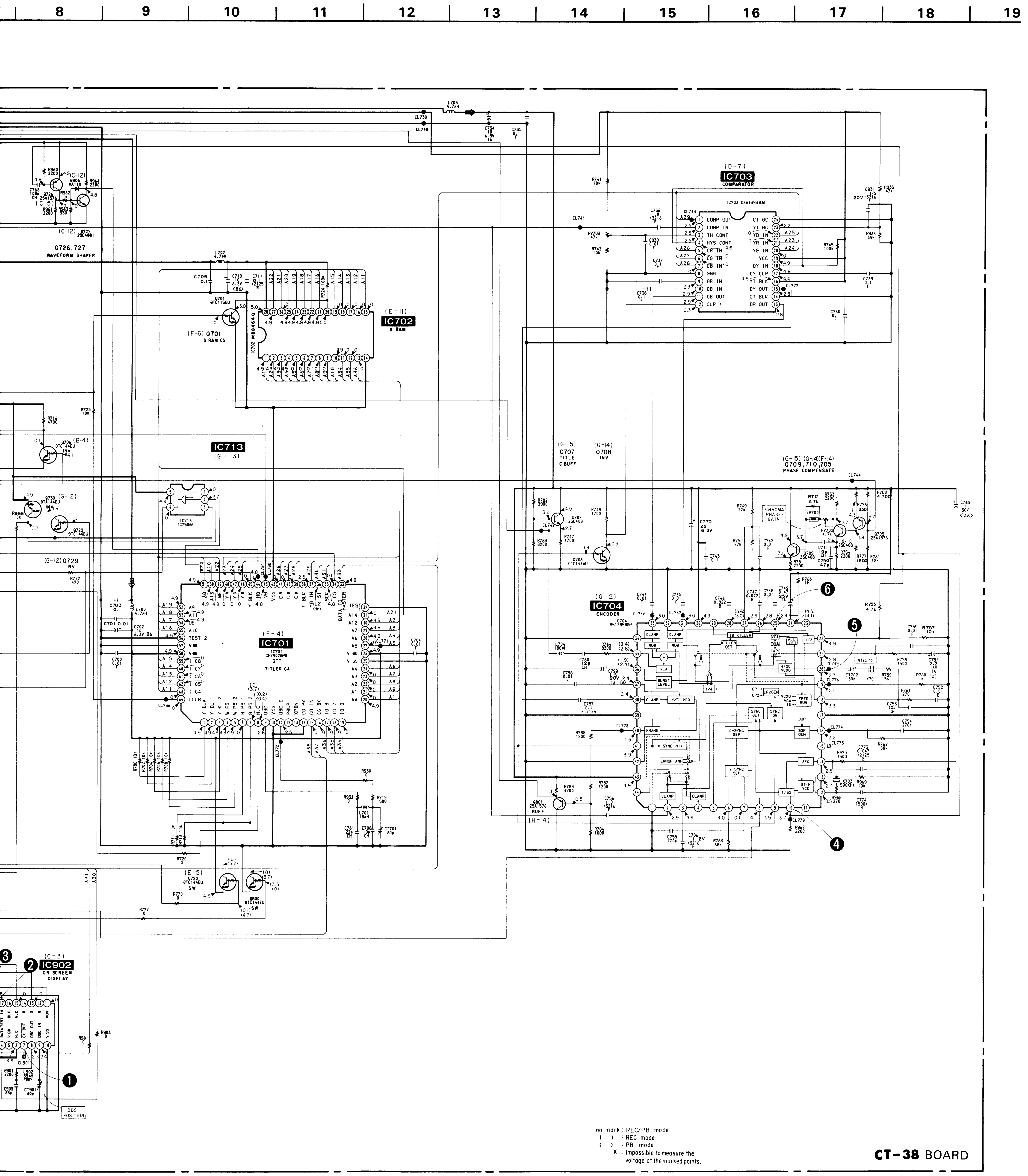
C
D
E
F
G
H
I
J
K
L
M
N
O
V704 15P FP-299
CAM/TITLE Y
CAM Y
CAM GND
CAM C
TITLE C
TITLE Y
REF Y
SS GND
SS 4.9V
VOB2/Y BLK
VA PB MODE
DDS
SCK
DATA TO SLVE
DATA TO MASTR
TO VA-67 BOARD CN704
(See page 116.)
TO VA
CN705 20P AMP
MASK
RF SWP
JOG VD SG
JOG
PB C
COMP SYNC
V MUTE
DS ON
EVF DS
JOG VE
CAM/TITLE C
SYNC DET
VA PB MODE
TITLE CS
EVER OC
S RAM CS
VIDEO 4.9V
CG STB
FADER CONT
VIDEO GND
TO VA-67 BOARD CN703
(See page 116.)
TO VA
IC707 VIDEO SW (C-7)
IC707 NJM2235M
IC708 VIDEO SW (C-6)
IC708 NJM2233AM
IC709 VIDEO SW (C-11)
IC709 NJM2233AM
Q728 2SC4081
Q704 2SC4081
D903 MA110
D904 MA110
D905 MA110
D901 (D-14)
IC901 MB8673190U
ON SCREEN DISPLAY CONTROL
CHARA GENE SG fo
PC UP
PC DD
H REST
V REST
CLK IN
CLK CONT
VDD
CLK OUT
TEST 1
TEST 2
TEST 3
VOB 1
VOW 1
DS ON
VOB IN
VOW IN
MASK
CG SW
CG H
ODC IN
JOG

GITAL TITLER, CHARACTER GENERATOR) SCHEMATIC DIAGRAM
CT-38 BOARD : 2000 series—


2
3
4
5
6
7
8
9
10
11
12
15P FP-299
CAM/TITLE Y
CAM Y
CAM GND
CAM C
TITLE C
TITLE Y
REF Y
SS GND
SS 4.9V
VDB2/Y BLK
VA PB MODE
DDS
SCK
DATA TO SLVE
DATA TO MASTR
TO VA
20P AMP
MASK
RF SWP
JOG VD SG
JOG
PB C
COMP SYNC
V MUTE
DS ON
EVF DS
JOG VG
CAM/TITLE C
SYNC DET
VA PB MODE
TITLE CS
EVER DC
S RAM CS
VIDEO 4.9V
CG STB
FADER CONT
VIDEO GND
TO VA
IC707
VIDEO SW
(C-7)
IC707 NJM2235M
IC708
VIDEO SW
(C-6)
IC708 NJM2233AM
IC709
VIDEO SW
(C-11)
IC709 NJM2233AM
Q726,727
WAVEFORM SHAPER
IC702
S RAM
(E-11)
IC702 MB8464Q
(F-6) Q701
S RAM CS
IC713
(G-13)
IC713 TC7S08F
Q702 FM6S SW (C-13)
Q703 DTC144EU INV
Q706 DTC144EU
(G-12) Q729 INV
IC701
(F-4)
IC701 CF79028PG
QFP
TITLER GA
Q720 DTC144EU SW
Q800 DTC144EU SW
IC901
(B-3)
IC901 MB67319BU
ON SCREEN DISPLAY CONTROL
IC902
(C-3)
ON SCREEN DISPLAY
IC902 µPD6451AGT
D901
(D-14)
CHARA GENE SG fo
DDS POSITION
❶
❷
❸
L901 100µH
L703 4.7µH
L702 4.7µH
L700 4.7µH
L701 18µH


8
9
10
11
12
13
14
15
16
17
18
19
IC703
(D-7)
COMPARATOR
IC703 CXA1393AN
COMP OUT
COMP IN
TH CONT
HYS CONT
CR IN
CG IN
CB IN
GND
BR IN
BB IN
BG OUT
CLP 4
CT GC
YT GC
YB IN
YR IN
YG IN
VCC
BY IN
BY CLP
YT BLK
BY OUT
CT BLK
BR OUT
IC702
(E-11)
S RAM
IC702 MB8464Q
(F-6) Q701
S RAM CS
Q701 DTC115EU
Q726,727
WAVEFORM SHAPER
(C-12)
(C-5)
Q726 2SA1576
Q727 2SC4081
D904 MA110
IC713
(G-13)
IC713 TC7S08F
(B-4) Q706 DTC144EU
INV
(G-12) Q730 DTA144EU
INV
Q729 DTC144EU
(G-12) Q729
INV
IC701
(F-4)
IC701 CF79028PG
QFP
TITLER GA
TEST 2
LCLR
(G-15) Q707
TITLE C BUFF
Q707 2SC4081
(G-14) Q708
INV
Q708 DTC144WU
(G-15) (G-14)(F-14)
Q709,710,705
PHASE COMPENSATE
CHROMA PHASE/GAIN
Q709 2SC4081
Q710 2SC4081
Q705 2SA1576
IC704
(G-2)
ENCODER
IC704 M51285BGP
CLAMP
MOD
VCA
BURST LEVEL
Y/C MIX
FRAME
SYNC MIX
ERROR AMP
KILLER DET
ID KILLER
APC DET
VCXO
ACC DET
1/2
1/4
CP1
CP2
CP2OCN
FREE RUN
SYNC DET
SYNC SW
C-SYNC SEP
V-SYNC SEP
BGP GEN
AFC
1/32
32fH VCO
4fsc In
X701
X703 500KHz
Q801 2SA1576
BUFF
(H-14)
(E-5)
Q720 DTC144EU
SW
Q800 DTC144EU
SW
IC902
(C-3)
ON SCREEN DISPLAY
DDS POSITION
❶
❷
❸
❹
❺
❻

no mark : REC/PB mode
( ) : REC mode
〈 〉 : PB mode
✻ : Impossible to measure the voltage at the marked points.

CT-38 BOARD

• Signal path

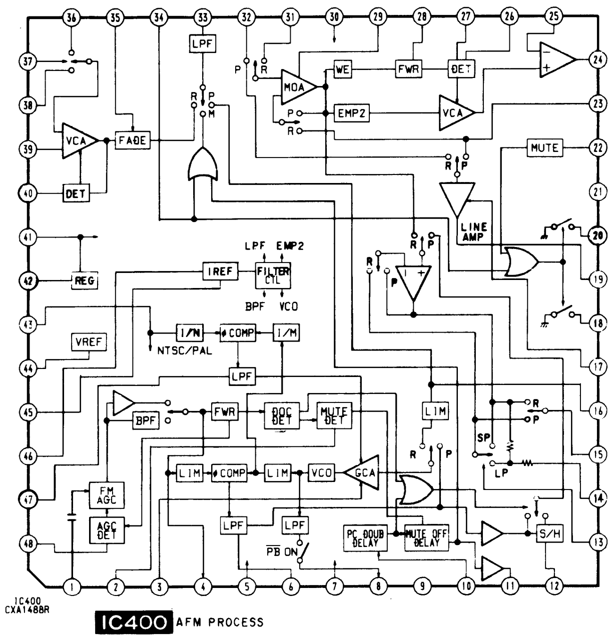
	VIDEO Signal		
	CHROMA	Y	Y/CHROMA
REC	➡	⇛	⇛

VA-67 (VIDEO/AUDIO) SCHEMATIC DIAGRAM

—Ref. No. VA-67 BOARD : 2000 series—

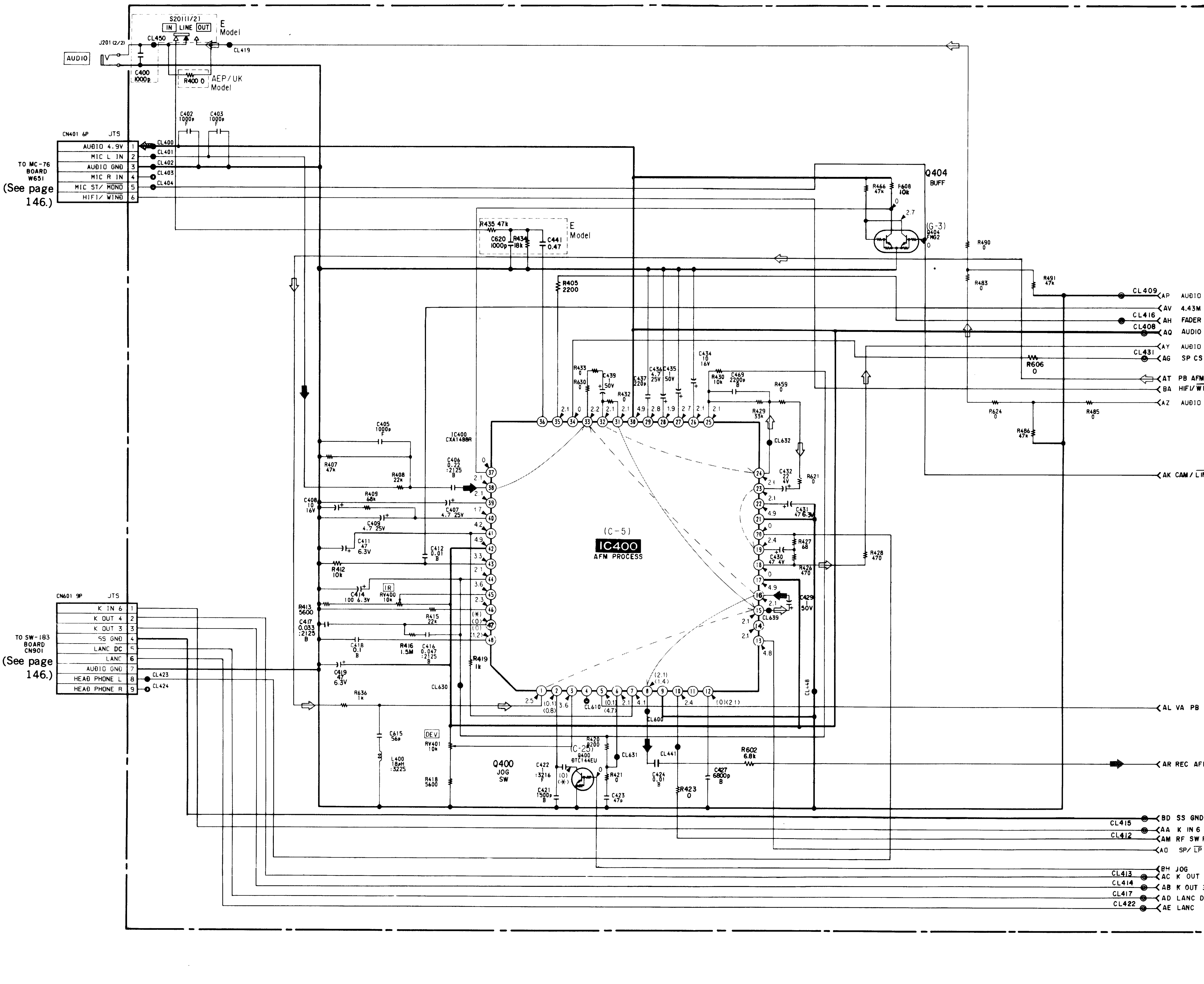
• Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	➡➡	➡➡➡	➡
PB	⇨	⇨⇨	⇨⇨⇨	⇨

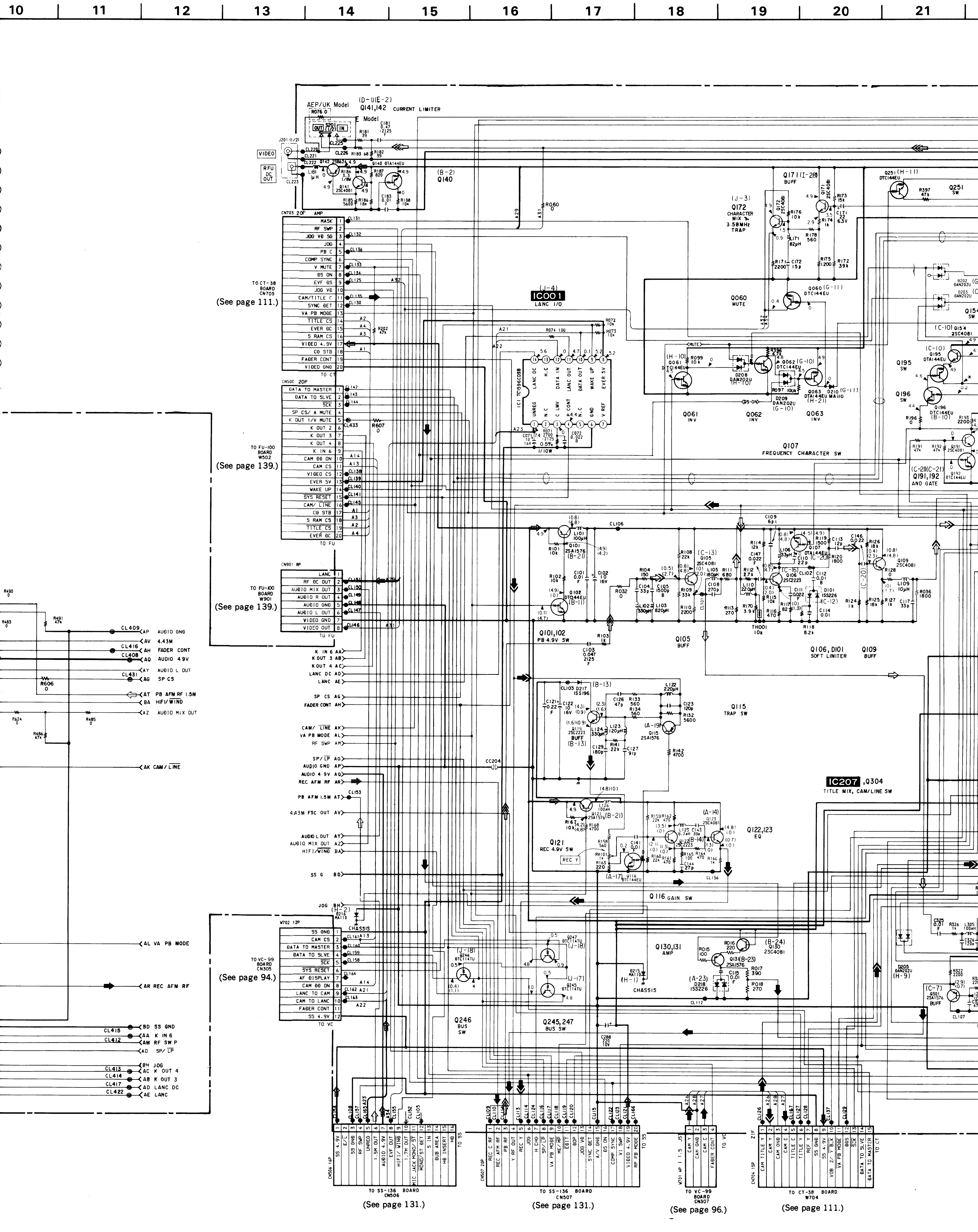


LPF
MDA
WE
FWR
DET
VCA
FADE
EMP2
MUTE
LINE AMP
LPF EMP2
IREF
FILTER CTL
BPF VCO
REG
VREF
I/M
ϕ COMP
NTSC/PAL
BPF
FWR
DOC DET
MUTE DET
LIM
SP
LP
FM AGC
AGC DET
LIM
ϕ COMP
LIM
VCO
GCA
LPF
LPF
PB ON
PC DOUB DELAY
MUTE OFF DELAY
S/H
IC400 CXA1488R

IC400 AFM PROCESS



S201(1/2)
IN LINE OUT
E Model
CL450
J201 (2/2)
AUDIO
CL419
C400 1000p
R400 0
AEP/UK Model
C402 1000p
C403 1000p
CN401 6P JTS
AUDIO 4.9V
MIC L IN
AUDIO GND
MIC R IN
MIC ST/ MONO
HIFI/ WIND
CL400
CL401
CL402
CL403
CL404
TO MC-76 BOARD W651 (See page 146.)
Q404 BUFF
R466 47k
R608 10k
(G-3)
R490 0
R435 47k
C620 1000p
R434 18k
C441 0.47
E Model
R405 2200
R483 0
R491 47k
CL409
AP AUDIO
AV 4.43M
CL416
AH FADER
CL408
AQ AUDIO
AY AUDIO
CL431
AG SP CS
R606 0
AT PB AFM
BA HIFI/W
AZ AUDIO
R624 0
R485 0
R486 47k
AK CAM/LI
C405 1000p
R407 47k
R408 22k
IC400 CXA1488R
C406 0.22 :2125 B
C408 10 16V
R409 68k
C409 4.7 25V
C407 4.7 25V
C411 47 6.3V
C412 0.01 B
R412 10k
C414 100 6.3V
IR
RV400 10k
R413 5600
C417 0.033 :2125 B
R415 22k
C418 0.1 B
R416 1.5M
C416 0.047 :2125 B
R419 1k
C419 47 6.3V
R636 1k
CL630
(C-5)
IC400
AFM PROCESS
R433 0
R630 0
C439 1 50V
R432 0
C437 220p
C436 4.7 25V
C435 1 50V
C434 10 16V
R430 10k
C469 2200p B
R459 0
R429 33k
CL632
C432 22 4V
R621 0
C431 47 6.3V
R427 68
C430 47 4V
R426 470
R428 470
C429 1 50V
CL639
CL448
CN601 9P JTS
K IN 6
K OUT 4
K OUT 3
SS GND
LANC DC
LANC
AUDIO GND
HEAD PHONE L
HEAD PHONE R
CL423
CL424
TO SW-183 BOARD CN901 (See page 146.)
CL610
CL600
C615 56p
DEV
RV401 10k
L400 18mH :3225
R418 5600
Q400 JOG SW
C422 :3216 F
C421 1500p B
R420 8200
Q400 DTC144EU
(C-2)
R421 0
C423 47p
CL631
CL441
C424 0.01 B
R423 0
R602 6.8k
C427 6800p B
AL VA PB
AR REC AF
CL415
BD SS GND
AA K IN 6
CL412
AM RF SW
AO SP/ LP
BH JOG
CL413
AC K OUT
CL414
AB K OUT
CL417
AD LANC D
CL422
AE LANC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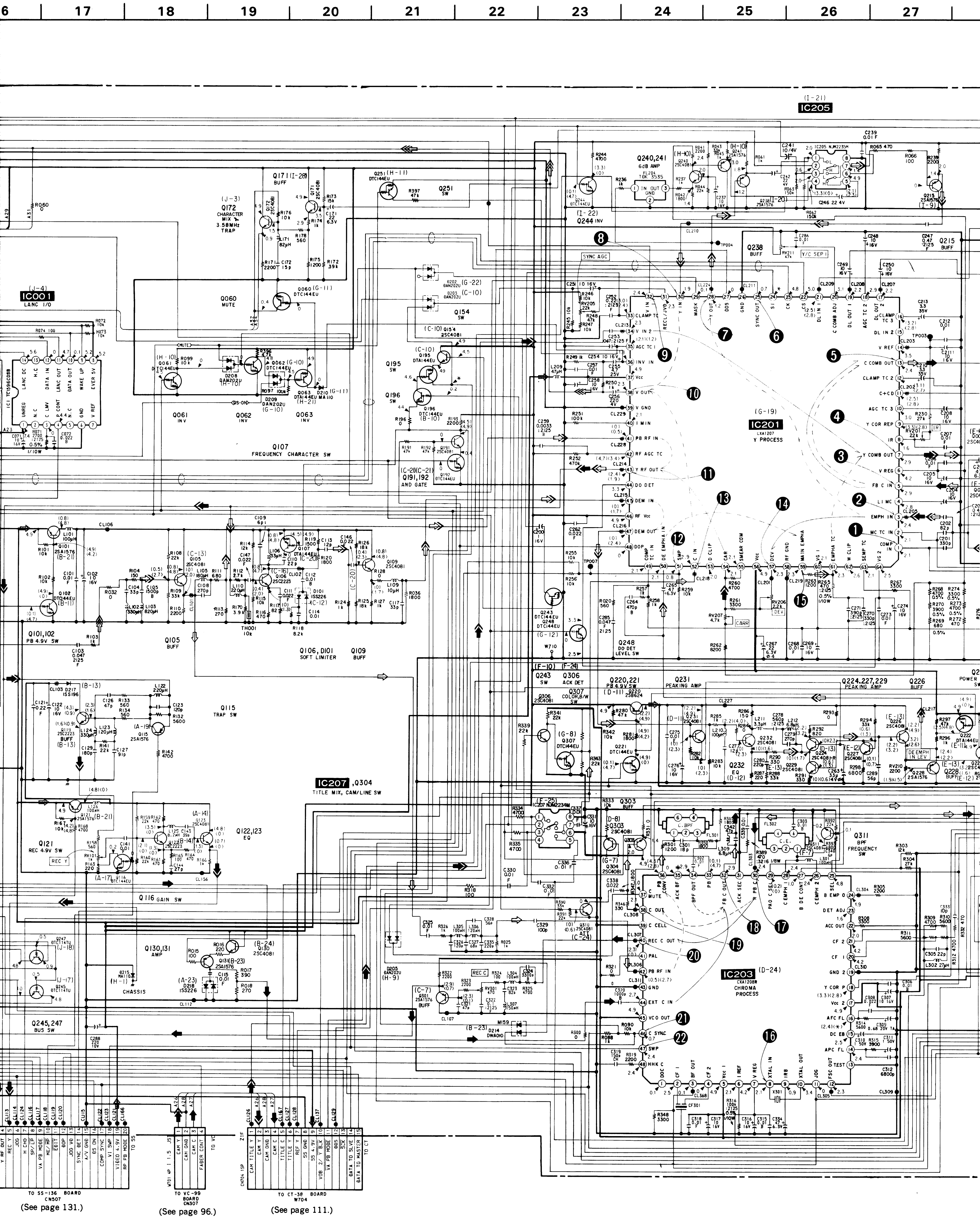
AEP/UK Model
E Model
(D-1)(E-2)
Q141,142 CURRENT LIMITER
VIDEO
RFU DC OUT
J201 (1/2)
(B-2)
Q140
CN703 20P AMP
MASK
RF SWP
JOG V0 SG
JOG
PB C
COMP SYNC
V MUTE
BS ON
EVF BS
JOG VO
CAM/TITLE C
SYNC DET
VA PB MODE
TITLE CS
EVER DC
S RAM CS
VIDEO 4.9V
CG STB
FADER CONT
VIDEO GND
TO CT-38 BOARD CN705
(See page 111.)
CN500 20P
DATA TO MASTER
DATA TO SLVE
SCK
SP CS/ A MUTE
K OUT 1/V MUTE
K OUT 2
K OUT 3
K OUT 4
K IN 6
CAM DD ON
CAM CS
VIDEO CS
EVER 5V
WAKE UP
SYS RESET
CAM/ LINE
CG STB
S RAM CS
TITLE CS
EVER DC
TO FU-100 BOARD W502
(See page 139.)
CN901 8P
LANC
RF DC OUT
AUDIO MIX OUT
AUDIO R OUT
AUDIO GND
AUDIO L OUT
VIDEO GND
VIDEO OUT
TO FU-100 BOARD W901
(See page 139.)
(J-4)
IC001
LANC I/O
IC1 TC9596CDSB
Q171 (I-2B) BUFF
(J-3) Q172 CHARACTER MIX 3.58MHz TRAP
Q060 MUTE
Q061 INV
Q062 INV
Q063 INV
Q107 FREQUENCY CHARACTER SW
Q251 SW
Q195 SW
Q196 SW
(C-20)(C-21) Q191,192 AND GATE
Q101,102 PB 4.9V SW
Q105 BUFF
Q106, D101 SOFT LIMITER
Q109 BUFF
Q115 TRAP SW
IC207, Q304 TITLE MIX, CAM/LINE SW
Q121 REC 4.9V SW
Q122,123 EQ
Q116 GAIN SW
Q130,131 AMP
CHASSIS
Q246 BUS SW
Q245,247 BUS SW
(C-7) Q301 2SA1576 BUFF
D205 DAN202U (H-9)
CL409 AP AUDIO GND
AV 4.43M
CL416 AH FADER CONT
CL408 AQ AUDIO 4.9V
AY AUDIO L OUT
CL431 AG SP CS
AT PB AFM RF 1.5M
BA HIFI/WIND
AZ AUDIO MIX OUT
AK CAM/LINE
AL VA PB MODE
AR REC AFM RF
CL415 BD SS GND
AA K IN 6
CL412 AM RF SWP
AO SP/LP
BH JOG
CL413 AC K OUT 4
CL414 AB K OUT 3
CL417 AD LANC DC
CL422 AE LANC
K IN 6 AA
K OUT 3 AB
K OUT 4 AC
LANC DC AD
LANC AE
SP CS AG
FADER CONT AH
CAM/ LINE AK
VA PB MODE AL
RF SWP AM
SP/LP AO
AUDIO GND AP
AUDIO 4.9V AQ
REC AFM RF AR
PB AFM 1.5M AT
4.43M FSC OUT AV
AUDIO L OUT AY
AUDIO MIX OUT AZ
HIFI/WIND BA
SS G BD
JOG BH
W702 12P
SS GND
CAM CS
DATA TO MASTER
DATA TO SLVE
SCK
SYS RESET
AF DISPLAY
CAM DD ON
LANC TO CAM
CAM TO LANC
FADER CONT
SS 4.9V
TO VC-99 BOARD CN305
(See page 94.)
CN506 16P
SS 4.9V
E/L
SS GND
RF SWP
UNREG
1.5M OUT
AUDIO 4.9V
EVF OUT
HIFI/WIND
1.7M OUT
MIC JACK MONO/ST
MONO/ST DET
S IN
DUB AREA
HB INSERT
HB
TO SS
TO SS-136 BOARD CN506
(See page 131.)
CN507 20P
REC C RF
REC AFM RF
PB AFM RF
Y RF OUT
REC Y
JOG
H CHG
SP/LP
VA PB MODE
ME/MP
EDIT
DOP
JOG VD
SYNC DET
A/V GND
DS ON
COMP SYNC
V1 SWP
VIDEO 4.9V
RP PB MODE
TO SS
TO SS-136 BOARD CN507
(See page 131.)
W701 4P
CAM Y
CAM GND
CAM C
FADER CONT
TO VC
TO VC-99 BOARD CN307
(See page 96.)
CN704 15P
CAM TITLE Y
CAM Y
CAM GND
CAM C
TITLE C
TITLE Y
REF Y
SS GND
SS 4.9V
VOB 2/ Y BLK
VA PB BLK
DDS
SCK
DATA TO SLVE
DATA TO MASTER
TO CT
TO CT-38 BOARD W704
(See page 111.)



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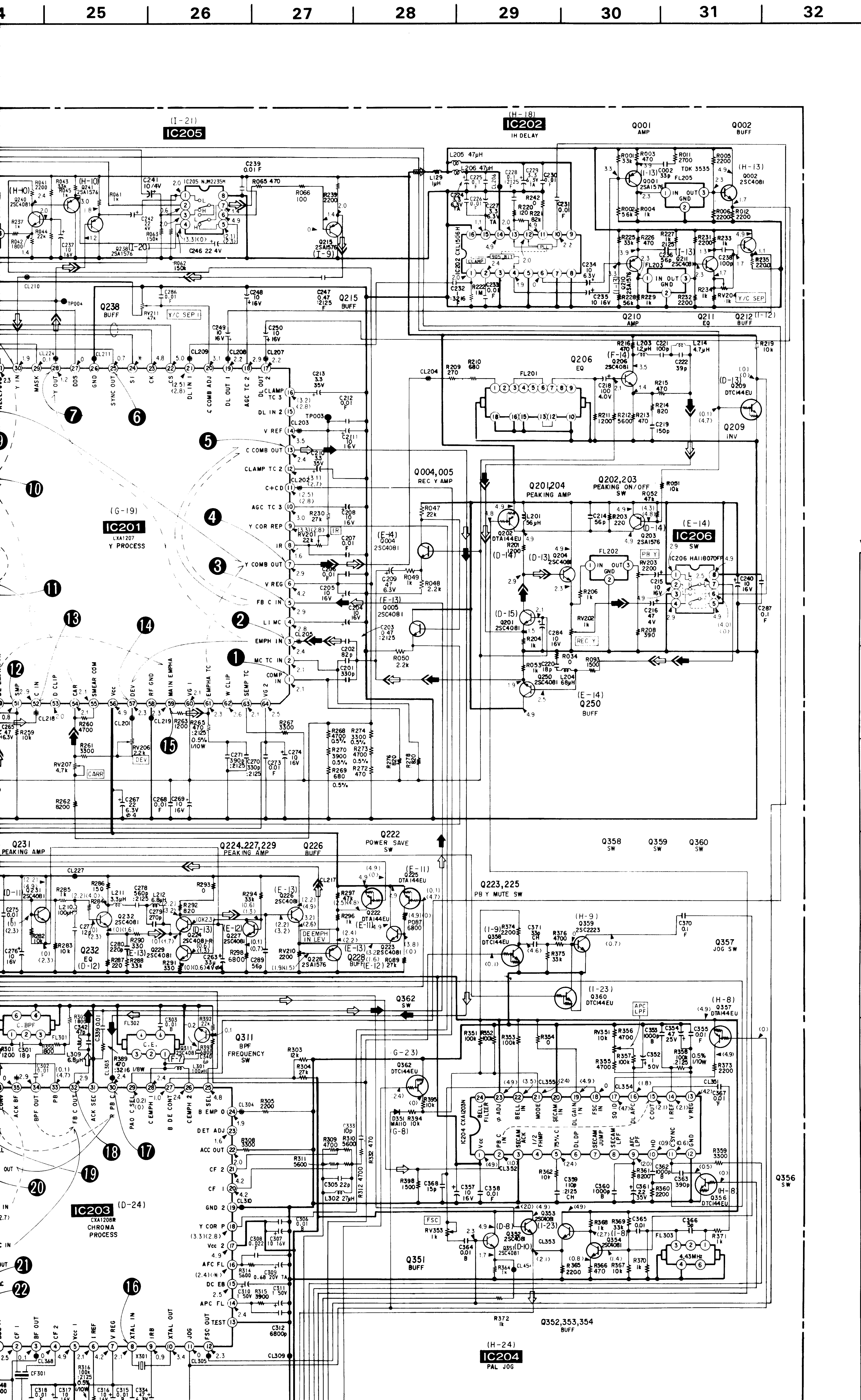
IC205
(I-21)
IC001
LANC I/O
(J-4)
IC201
LXA1207
Y PROCESS
(G-19)
IC203
CXA1208R
CHROMA PROCESS
(D-24)
IC207, Q304
TITLE MIX, CAM/LINE SW
Q171 (I-28) BUFF
Q172 CHARACTER MIX 3.58MHz TRAP
Q060 MUTE
Q061 INV
Q062 INV
Q063 INV
Q107 FREQUENCY CHARACTER SW
Q251 SW
Q154 SW
Q195 SW
Q196 SW
Q191,192 AND GATE
Q240,241 6dB AMP
Q244 INV
Q238 BUFF
Q215 BUFF
Q101,102 PB 4.9V SW
Q105 BUFF
Q106, D101 SOFT LIMITER
Q109 BUFF
Q115 TRAP SW
Q121 REC 4.9V SW
Q122,123 EQ
Q116 GAIN SW
Q130,131 AMP
Q245,247 BUS SW
Q243 SW
Q306 ACK DET
Q307 COLOR,B/W SW
Q220,221 PB 4.9V SW
Q231 PEAKING AMP
Q224,227,229 PEAKING AMP
Q226 BUFF
Q232 EQ
Q248 DO DET LEVEL SW
Q303 BUFF
Q311 BPF FREQUENCY SW
Q301 BUFF
CHASSIS
TO SS-136 BOARD CN507
(See page 131.)
TO VC-99 BOARD CN307
(See page 96.)
TO CT-38 BOARD W704
(See page 111.)



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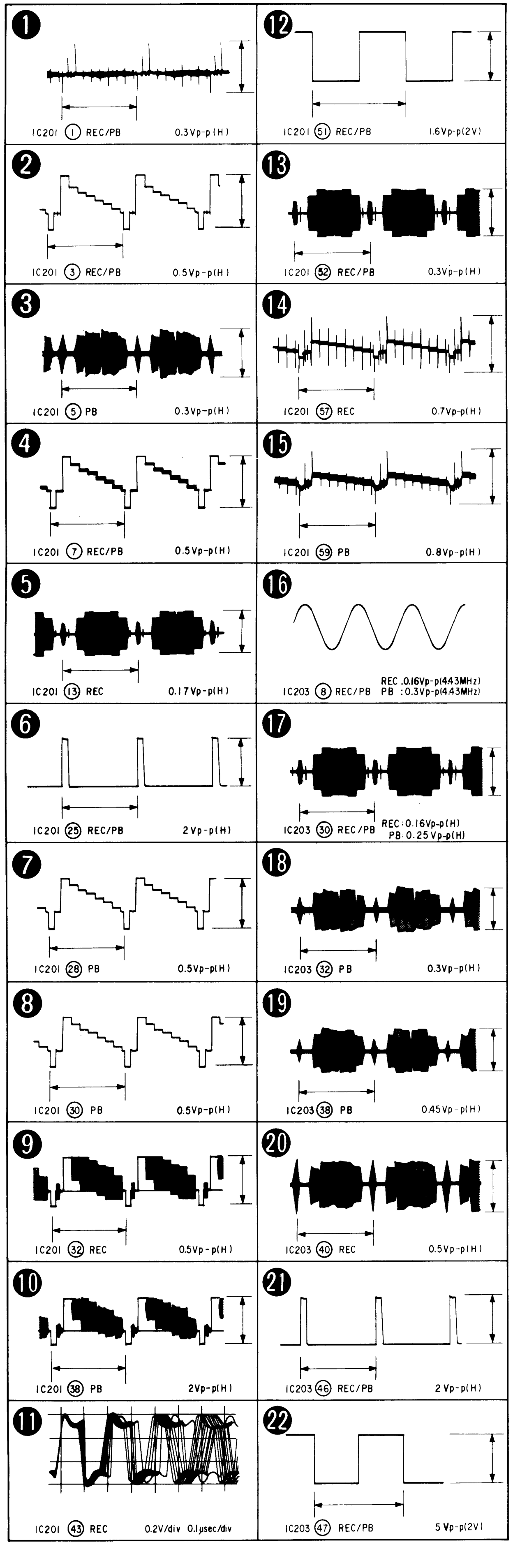
(I-21) IC205
(H-18) IC202 1H DELAY
Q001 AMP
Q002 BUFF
Q238 BUFF
Q215 BUFF
Q210 AMP
Q211 EQ
Q212 (I-12) BUFF
Q206 EQ
Q209 INV
(G-19) IC201 CXA1207 Y PROCESS
Q004,005 REC Y AMP
Q201,204 PEAKING AMP
Q202,203 PEAKING ON/OFF SW
(E-14) IC206 HA11807OFP SW
(E-14) Q250 BUFF
Q231 PEAKING AMP
Q224,227,229 PEAKING AMP
Q226 BUFF
Q222 POWER SAVE SW
Q223,225 PB Y MUTE SW
Q358 SW
Q359 SW
Q360 SW
Q357 JOG SW
Q362 SW
Q311 BPF FREQUENCY SW
Q356 SW
Q351 BUFF
Q352,353,354 BUFF
(H-24) IC204 PAL JOG
IC204 CXA1203N
IC203 (D-24) CXA1208M CHROMA PROCESS
Q232 EQ (D-12)
Y/C SEP
DEEMPH IN LEV
REC Y
PB Y
CARR
DEV
APC LPF
FSC
4.43MHz
VA-67 BOARD

VA-67 BOARD

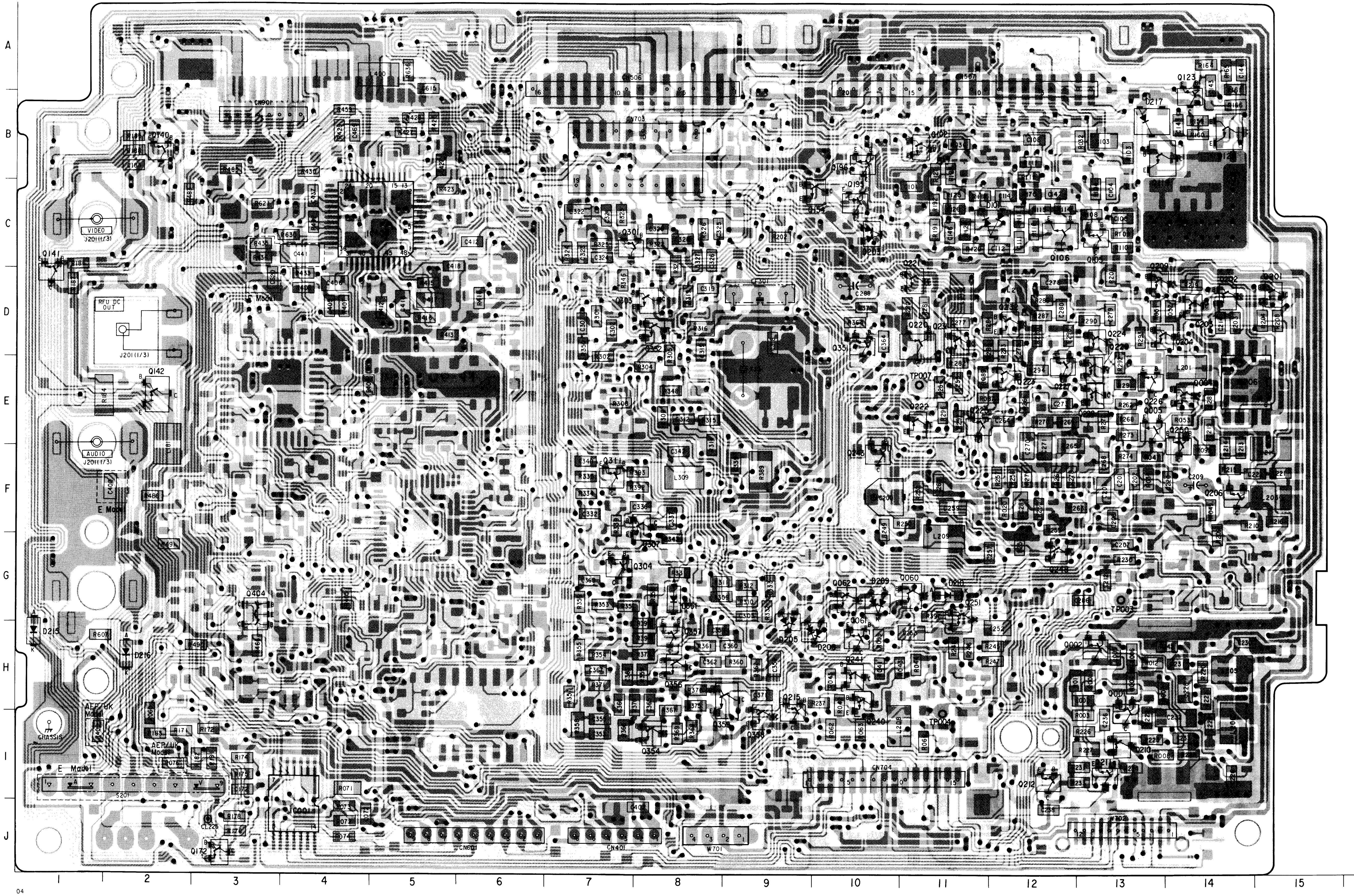


❶ IC201 ① REC/PB 0.3Vp-p(H)
⓬ IC201 (51) REC/PB 1.6Vp-p(2V)
❷ IC201 ③ REC/PB 0.5Vp-p(H)
⓭ IC201 (52) REC/PB 0.3Vp-p(H)
❸ IC201 ⑤ PB 0.3Vp-p(H)
⓮ IC201 (57) REC 0.7Vp-p(H)
❹ IC201 ⑦ REC/PB 0.5Vp-p(H)
⓯ IC201 (59) PB 0.8Vp-p(H)
❺ IC201 ⑬ REC 0.17Vp-p(H)
⓰ IC203 ⑧ REC/PB REC 0.16Vp-p(4.43MHz) PB 0.3Vp-p(4.43MHz)
❻ IC201 ㉕ REC/PB 2Vp-p(H)
⓱ IC203 ㉚ REC/PB REC:0.16Vp-p(H) PB:0.25Vp-p(H)
❼ IC201 ㉘ PB 0.5Vp-p(H)
⓲ IC203 ㉜ PB 0.3Vp-p(H)
❽ IC201 ㉚ PB 0.5Vp-p(H)
⓳ IC203 ㊳ PB 0.45Vp-p(H)
❾ IC201 ㉜ REC 0.5Vp-p(H)
⓴ IC203 ㊵ REC 0.5Vp-p(H)
❿ IC201 ㊳ PB 2Vp-p(H)
㉑ IC203 ㊻ REC/PB 2Vp-p(H)
⓫ IC201 ㊸ REC 0.2V/div 0.1μsec/div
㉒ IC203 ㊼ REC/PB 5Vp-p(2V)

VA-67 (VIDEO/AUDIO) **PRINTED WIRING BOARD**

—Ref. No. VA-67 BOARD : 2000 series—

VA-67 BOARD (CONDUCTOR SIDE)



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C
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I
J
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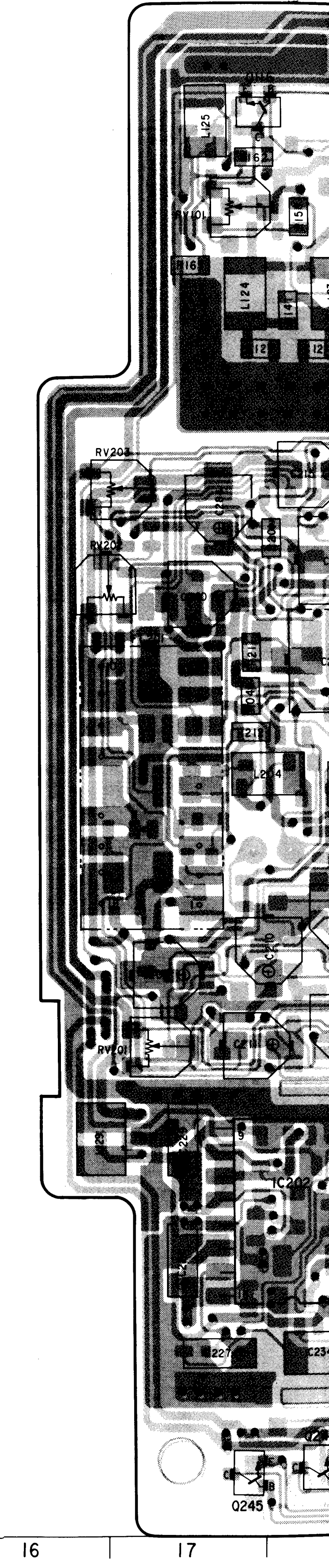
VIDEO
J201(1/3)
AUDIO
J201(1/3)
RFU DC OUT
J201(1/3)
E Model
AEP/UK Model
CHASSIS
S201
CN901
CN703
CN704
CN601
CN401
W701
W702
IC506
IC507
IC301
L201
L205
L309
Q141
Q142
Q140
Q123
Q195
Q196
Q301
Q304
Q307
Q311
Q354
Q356
Q358
Q404
Q172
D215
D216
D217
TP001
TP002
TP003
TP004
TP007

VA-67 BOARD (C



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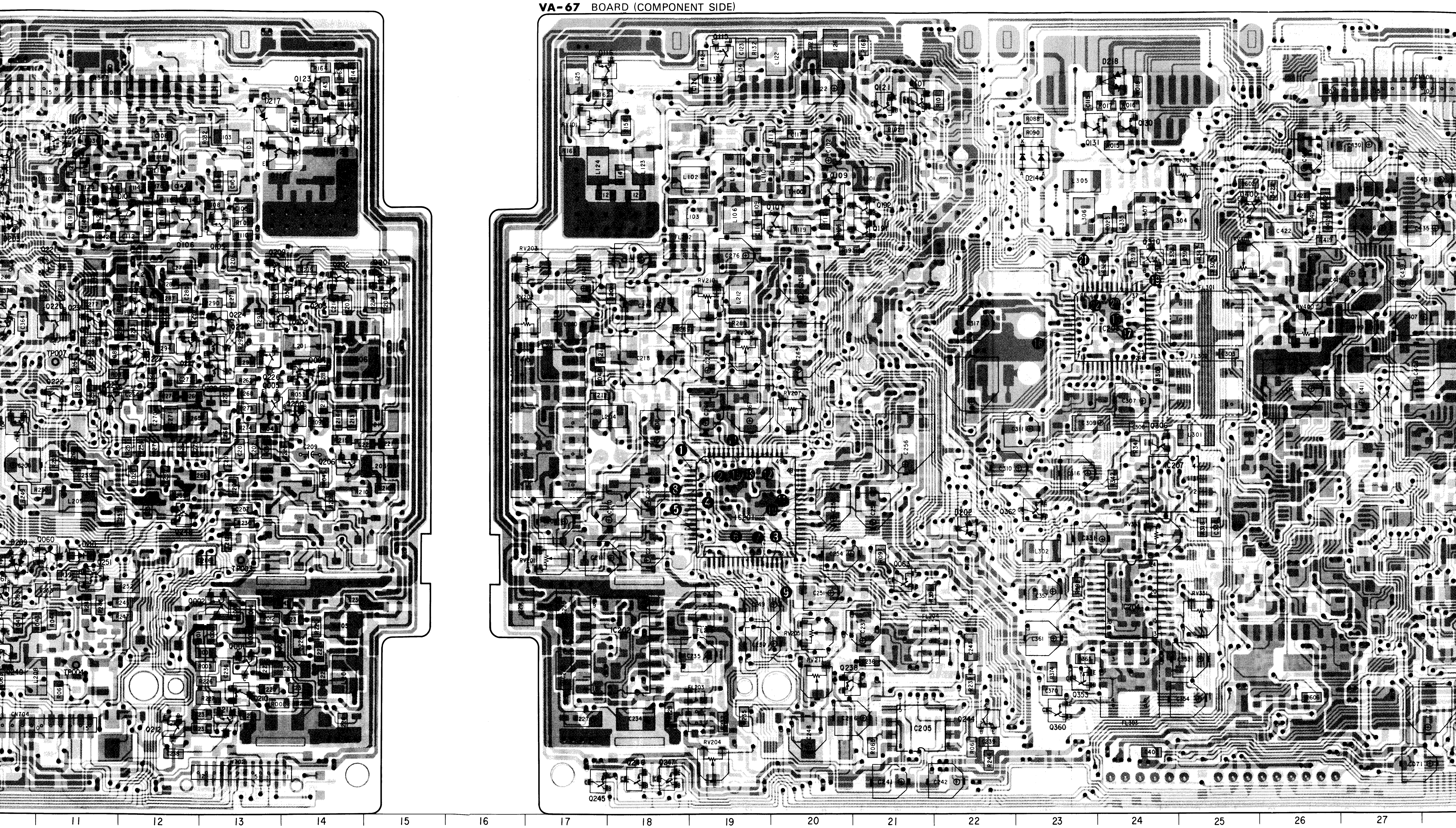
RV201
RV202
L124
L125
L204
IC202
Q245

04

VA-67 BOARD (COMPONENT SIDE)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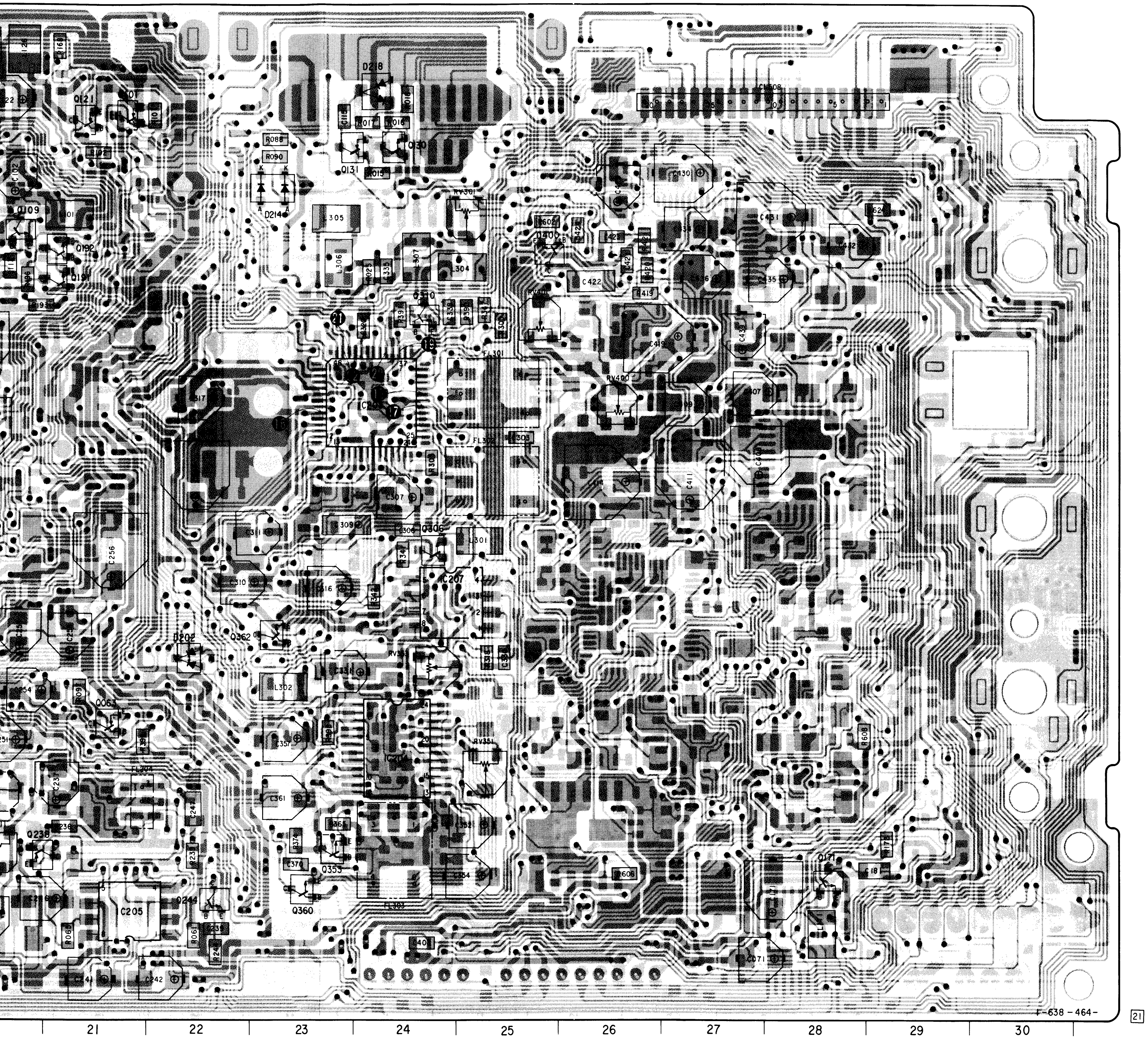
IC201
IC207
IC304
C205
CN704
TP004
TP007



< DIODE >

D101	8-719-800-76	1SS226
D202	8-719-941-86	DAN202U
D203	8-719-941-86	DAN202U
D205	8-719-941-86	DAN202U
D208	8-719-941-86	DAN202U
D209	8-719-941-86	DAN202U
D210	8-719-404-46	MA110
D214	8-719-940-45	DWA010
D215	8-719-404-46	MA110
D216	8-719-404-46	MA110
D217	8-719-801-41	1SS196
D218	8-719-800-76	1SS226
D351	8-719-404-46	MA110

< IC >

IC001	8-759-999-02	TL1596CDB
IC201	8-752-036-19	CXA1207R
IC202	8-752-333-24	CXL1506M
IC203	8-752-036-20	CXA1208R
IC204	8-759-605-61	CXA1203N
IC205	8-759-710-29	NJM2235M
IC206	8-759-320-76	HA118070FP
IC207	8-759-710-07	NJM2234M
IC400	8-759-823-20	CXA-1488R

< TRANSISTOR >

Q001	8-729-905-23	2SA1576-R
Q002	8-729-905-35	2SC4081-R
Q004	8-729-905-35	2SC4081-R
Q005	8-729-905-35	2SC4081-R
Q060	8-729-905-18	DTC144EU
Q061	8-729-905-18	DTC144EU
Q062	8-729-905-18	DTC144EU
Q063	8-729-905-12	DTA144EU
Q101	8-729-905-23	2SA1576-R
Q102	8-729-905-18	DTC144EU
Q105	8-729-905-35	2SC4081-R
Q106	8-729-102-07	2SC2223-F13
Q107	8-729-905-12	DTA144EU
Q109	8-729-905-35	2SC4081-R
Q115	8-729-905-23	2SA1576-R
Q116	8-729-905-18	DTC144EU
Q119	8-729-102-07	2SC2223-F13
Q121	8-729-905-23	2SA1576-R
Q122	8-729-102-07	2SC2223-F13
Q123	8-729-905-35	2SC4081-R
Q130	8-729-905-35	2SC4081-R
Q131	8-729-905-23	2SA1576-R
Q140	8-729-905-12	DTA144EU
Q141	8-729-905-35	2SC4081-R
Q142	8-729-141-48	2SB624-BV345
Q154	8-729-905-35	2SC4081-R
Q171	8-729-905-35	2SC4081-R
Q172	8-729-905-35	2SC4081-R
Q191	8-729-905-35	2SC4081-R
Q192	8-729-905-18	DTC144EU
Q195	8-729-905-12	DTA144EU
Q196	8-729-905-18	DTC144EU
Q201	8-729-905-35	2SC4081-R
Q202	8-729-905-12	DTA144EU
Q203	8-729-905-23	2SA1576-R
Q204	8-729-905-35	2SC4081-R
Q206	8-729-905-35	2SC4081-R
Q209	8-729-905-18	DTC144EU
Q210	8-729-905-23	2SA1576-R
Q211	8-729-905-35	2SC4081-R
Q212	8-729-905-35	2SC4081-R
Q215	8-729-905-23	2SA1576-R
Q220	8-729-141-48	2SB624-BV345
Q221	8-729-905-18	DTC144EU
Q222	8-729-905-12	DTA144EU
Q223	8-729-905-35	2SC4081-R
Q224	8-729-905-35	2SC4081-R
Q225	8-729-905-12	DTA144EU
Q226	8-729-905-35	2SC4081-R
Q227	8-729-905-35	2SC4081-R
Q228	8-729-905-23	2SA1576-R
Q229	8-729-905-35	2SC4081-R
Q231	8-729-905-35	2SC4081-R
Q232	8-729-905-35	2SC4081-R
Q238	8-729-905-23	2SA1576-R
Q240	8-729-905-35	2SC4081-R
Q241	8-729-905-23	2SA1576-R
Q243	8-729-905-18	DTC144EU
Q244	8-729-905-18	DTC144EU
Q245	8-729-905-XX	DTC114TU
Q246	8-729-905-XX	DTC114TU
Q247	8-729-905-XX	DTC114TU
Q248	8-729-905-18	DTC144EU
Q250	8-729-905-35	2SC4081-R
Q251	8-729-905-18	DTC144EU
Q301	8-729-905-23	2SA1576-R
Q303	8-729-905-35	2SC4081-R
Q304	8-729-905-35	2SC4081-R
Q306	8-729-905-35	2SC4081-R
Q307	8-729-905-18	DTC144EU
Q310	8-729-905-35	2SC4081-R
Q311	8-729-905-35	2SC4081-R
Q351	8-729-905-35	2SC4081-R
Q352	8-729-905-35	2SC4081-R
Q353	8-729-905-35	2SC4081-R
Q354	8-729-905-35	2SC4081-R
Q356	8-729-905-18	DTC144EU
Q357	8-729-905-12	DTA144EU
Q358	8-729-905-18	DTC144EU
Q359	8-729-102-08	2SC2223-F14
Q360	8-729-905-18	DTC144EU
Q362	8-729-905-18	DTC144EU
Q400	8-729-905-18	DTC144EU
Q404	8-729-904-07	FMG2

CC-61 (RELAY), SS-136 (SERVO/SYSTEM CONTROL),FP-89, FP-90 (MECHADECK FLEXIBLE) PRINTED WIRING BOARDS

—Ref. No. CC-61 and SS-136 BOARDS : 3000 series, FP-89 and FP-90 BOARDS : 8000 series—

< DIODE >		
D501	8-719-941-86	DAN202U
D506	8-719-941-86	DAN202U
D510	8-719-404-46	MA110
D901	8-719-938-75	SB05-05CP
D902	8-719-938-75	SB05-05CP
D903	8-719-938-78	SB10-05PCP
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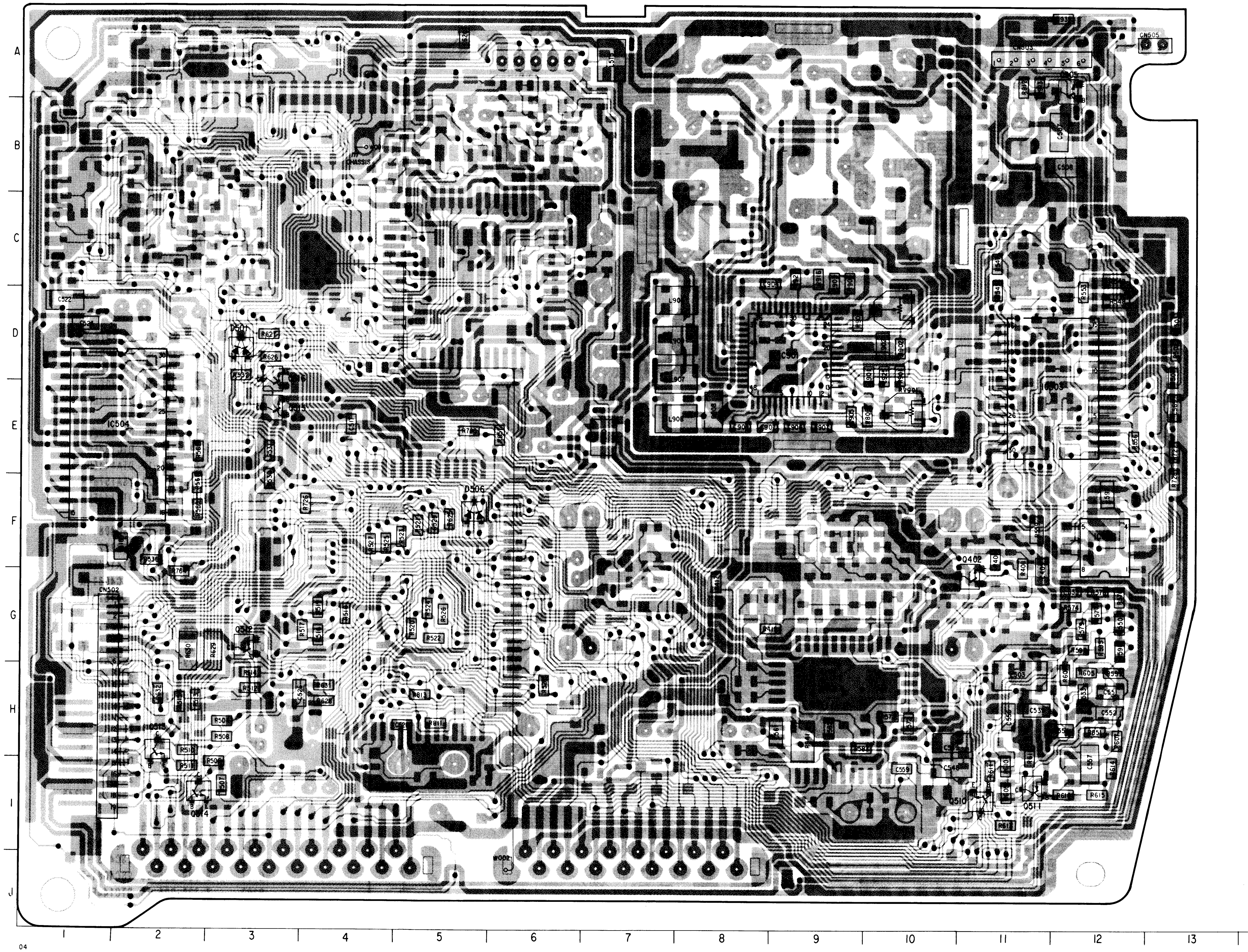
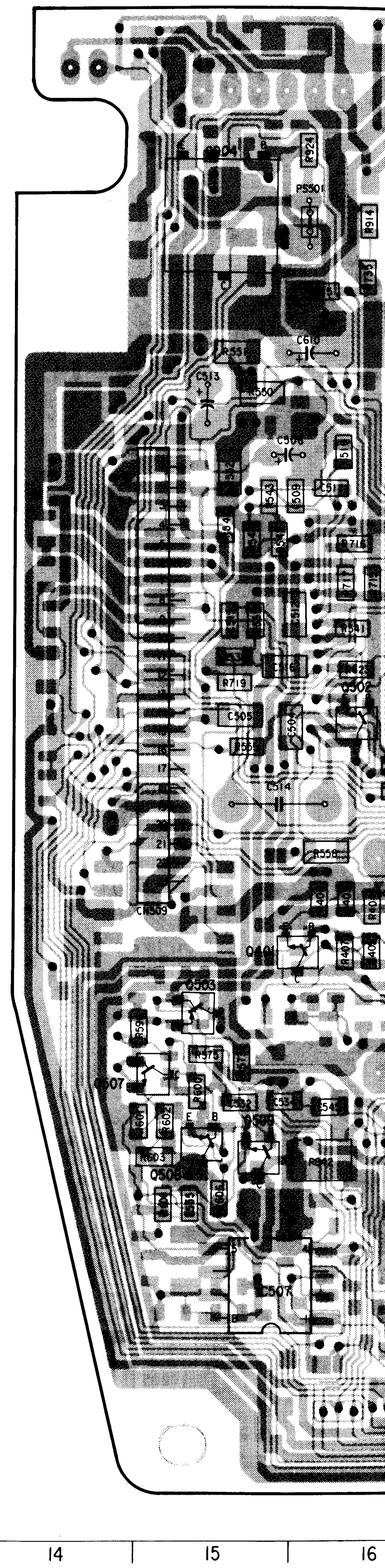
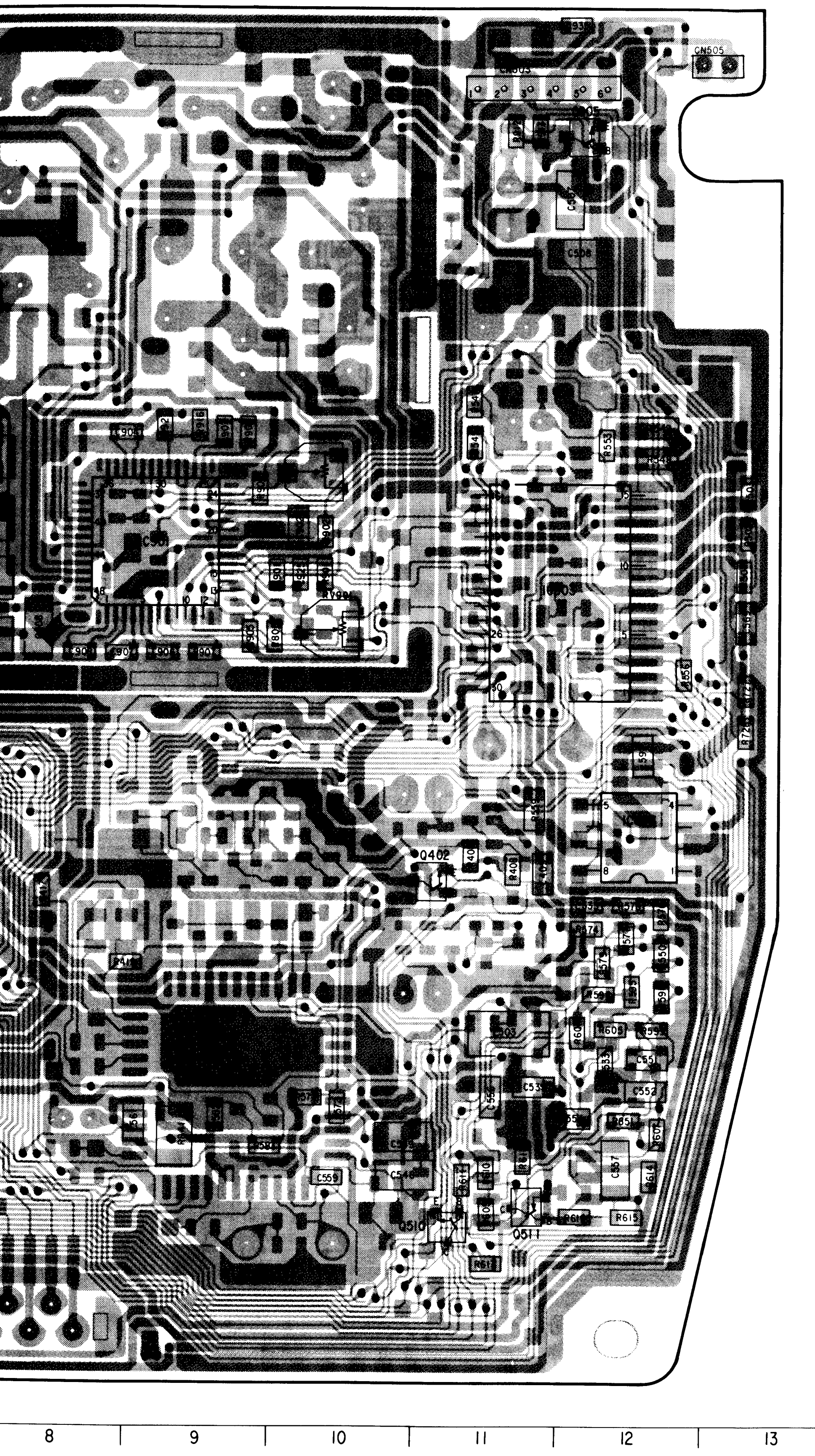
IC501	8-752-818-70	CXP80116-830Q
IC502	8-759-148-05	CXA8010M
IC503	8-759-990-55	CXA8006M
IC504	8-759-805-06	CXA1127M
IC506	8-752-035-48	CXA1204Q
IC507	8-759-998-92	LM393D
IC508	8-759-748-65	BR93CS46F
IC901	8-759-500-42	MB3783PFV
< TRANSISTOR >		
Q400	8-729-905-35	2SC4081-R
Q401	8-729-905-35	2SC4081-R
Q402	8-729-905-35	2SC4081-R
Q502	8-729-905-35	2SC4081-R
Q503	8-729-905-24	2SA1576-S
Q505	8-729-905-35	2SC4081-R
Q506	8-729-905-24	2SA1576-S
Q507	8-729-905-35	2SC4081-R
Q508	8-729-905-24	2SA1576-S
Q509	8-729-905-35	2SC4081-R
Q510	8-729-905-35	2SC4081-R
Q511	8-729-905-24	2SA1576-S
Q512	8-729-907-00	DTC114EU
Q513	8-729-905-35	2SC4081-R
Q514	8-729-905-35	2SC4081-R
Q515	8-729-905-18	DTC144EU
Q516	8-729-905-18	DTC144EU
Q540	8-729-822-48	FC101
Q901	8-729-805-25	2SB1121
Q902	8-729-805-25	2SB1121
Q903	8-729-805-25	2SB1121
Q904	8-729-820-47	2SB1202FAT
Q905	8-729-905-35	2SC4081-R

SS-136 BOARD (COMPONENT SIDE)

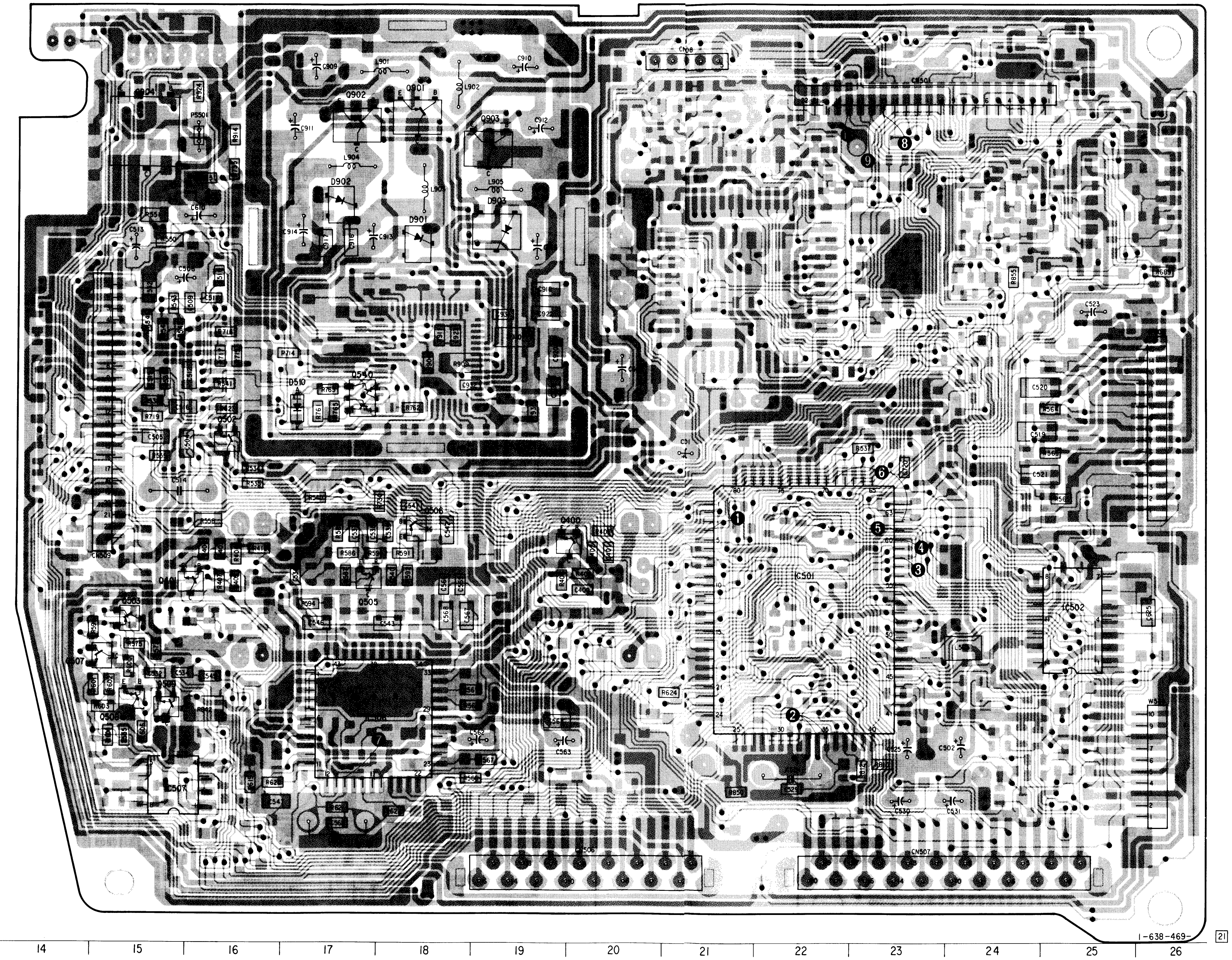


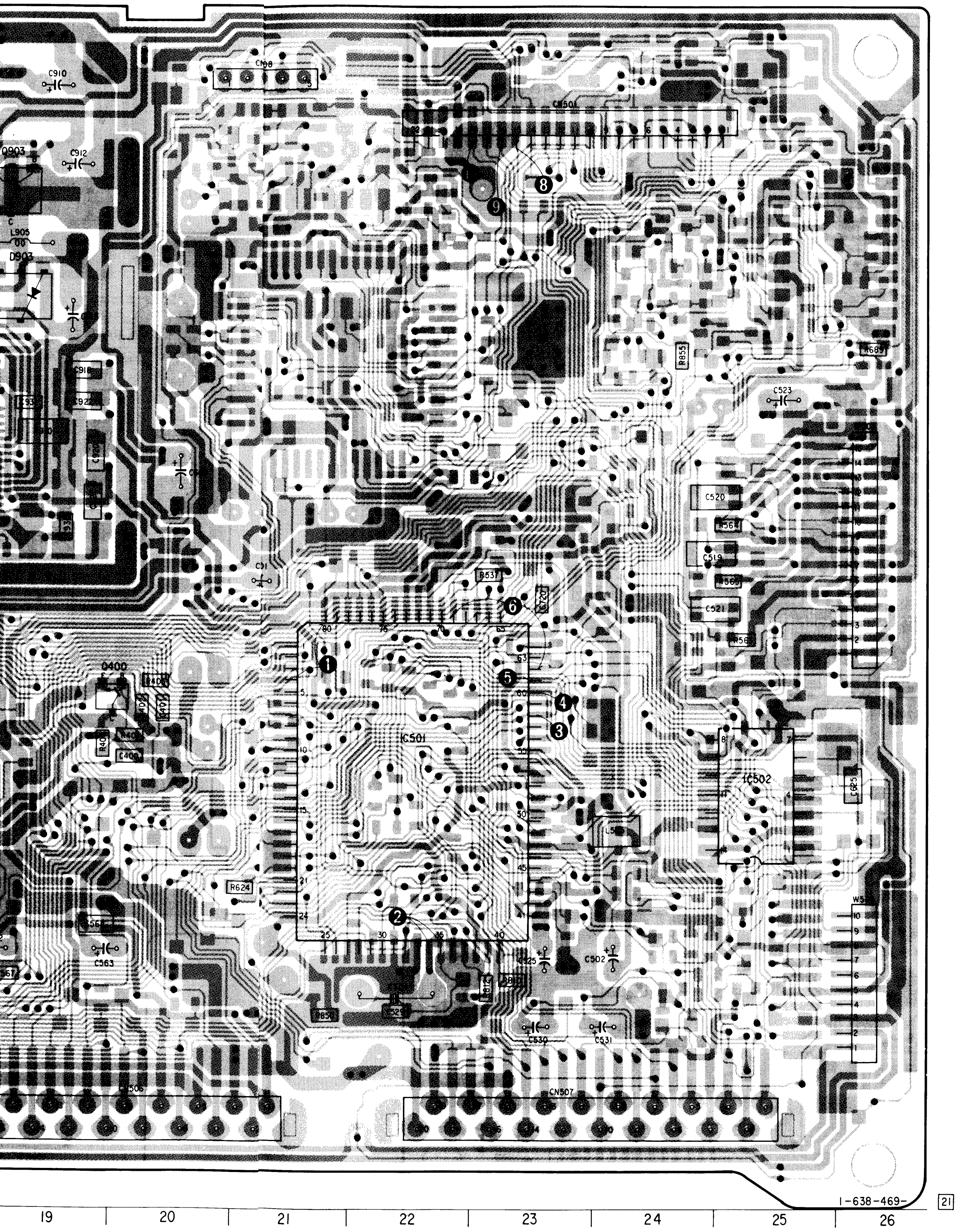
SS-136 BOARD (CONDUCTOR SIDE)

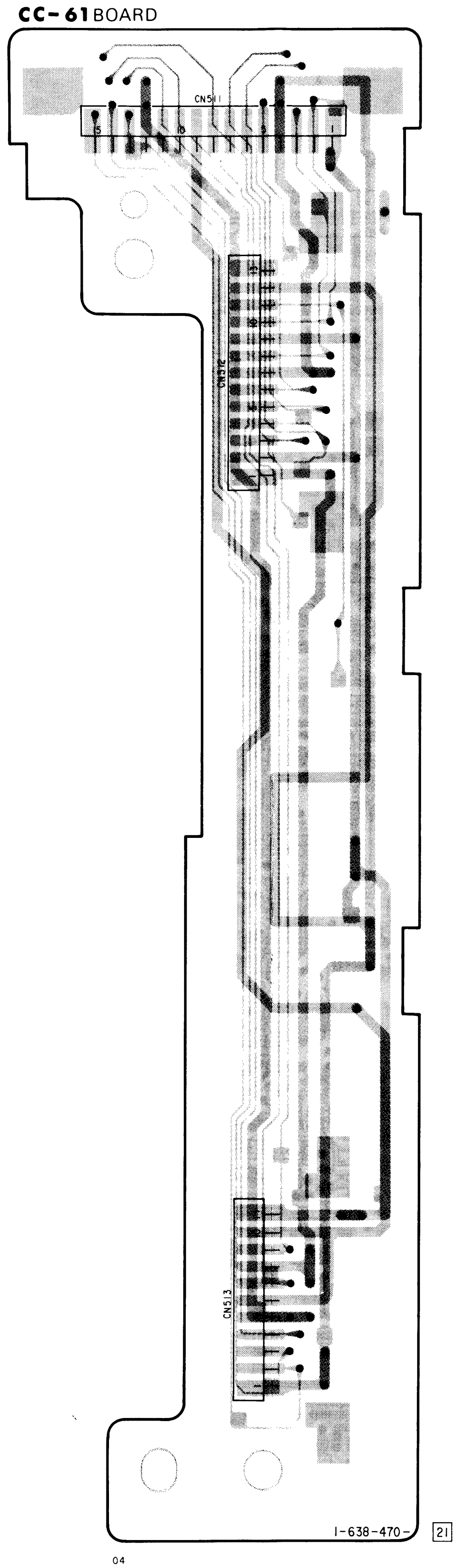



CN505
CN503
Q402
Q510
Q511
8
9
10
11
12
13

SS-136 BOARD (CONDUCTOR SIDE)


C909
L901
Q901
Q902
C910
CN908
CN501
L902
C911
Q903
C912
L904
L905
D902
D903
D901
C914
C913
Q904
P5501
C510
C513
Q540
D510
R714
Q502
Q401
Q503
Q505
Q506
Q507
Q508
Q400
IC501
IC502
R624
C502
C530
C531
C563
C520
C521
C523
CN506
CN507
1-638-469-
21
14
15
16
17
18
19
20
21
22
23
24
25
26


CN501
IC501
IC502
Q400
CN506
CN507
1-638-469-
21
19
20
21
22
23
24
25
26

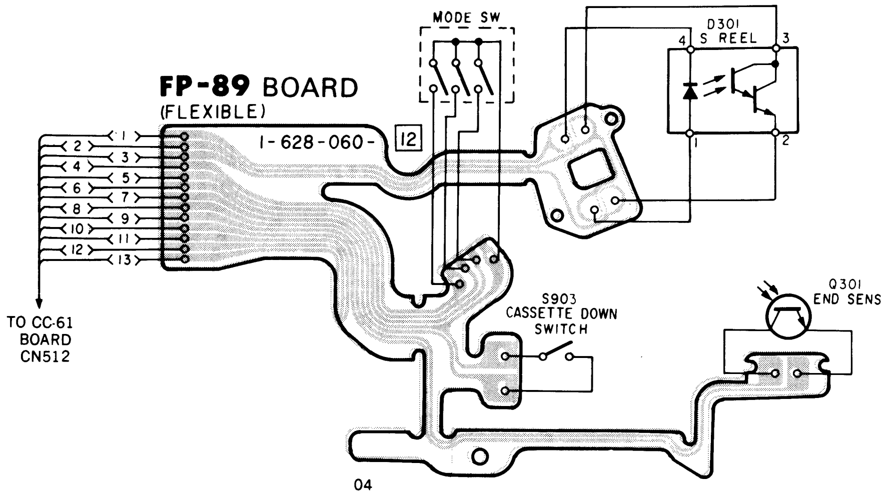

CC-61 BOARD
CN511
CN512
CN513
1-638-470-
21
04

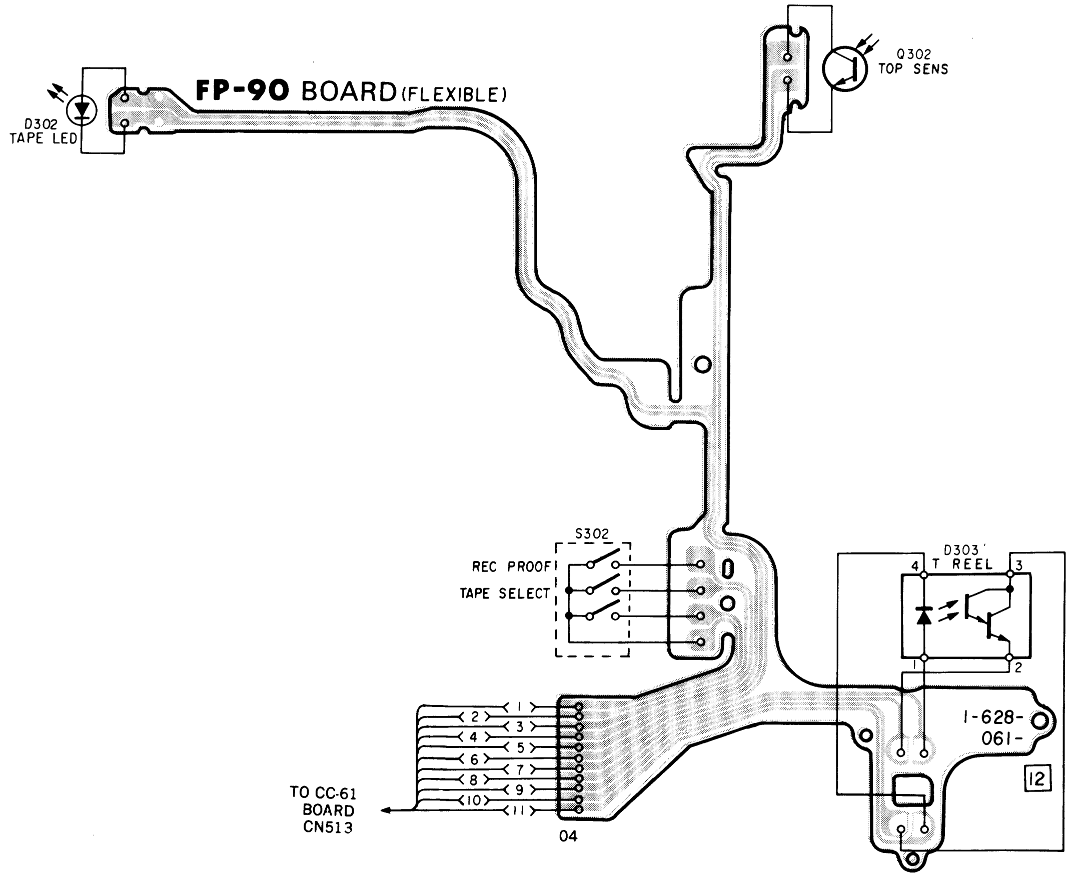
< DIODE >

D301	8-719-820-44 TLP-907-0

< TRANSISTOR >

Q301	8-729-906-48 EE-TP109


MODE SW
D301
S REEL
4
3
1
2
FP-89 BOARD
(FLEXIBLE)
1-628-060-
12
1
2
3
4
5
6
7
8
9
10
11
12
13
TO CC-61
BOARD
CN512
S903
CASSETTE DOWN
SWITCH
Q301
END SENS
04


D302
TAPE LED
FP-90 BOARD (FLEXIBLE)
Q302
TOP SENS
S302
REC PROOF
TAPE SELECT
D303
T REEL
4
3
1
2
1-628-
061-
12
1
2
3
4
5
6
7
8
9
10
11
TO CC-61
BOARD
CN513
04

< DIODE >

D302	8-719-940-81 GL452S
D303	8-719-820-44 COUPLER TLP-907-0

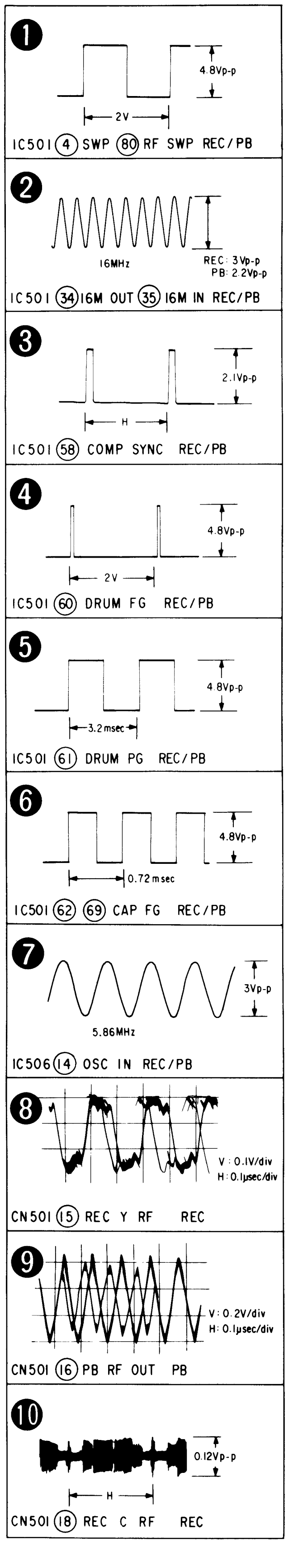
< TRANSISTOR >

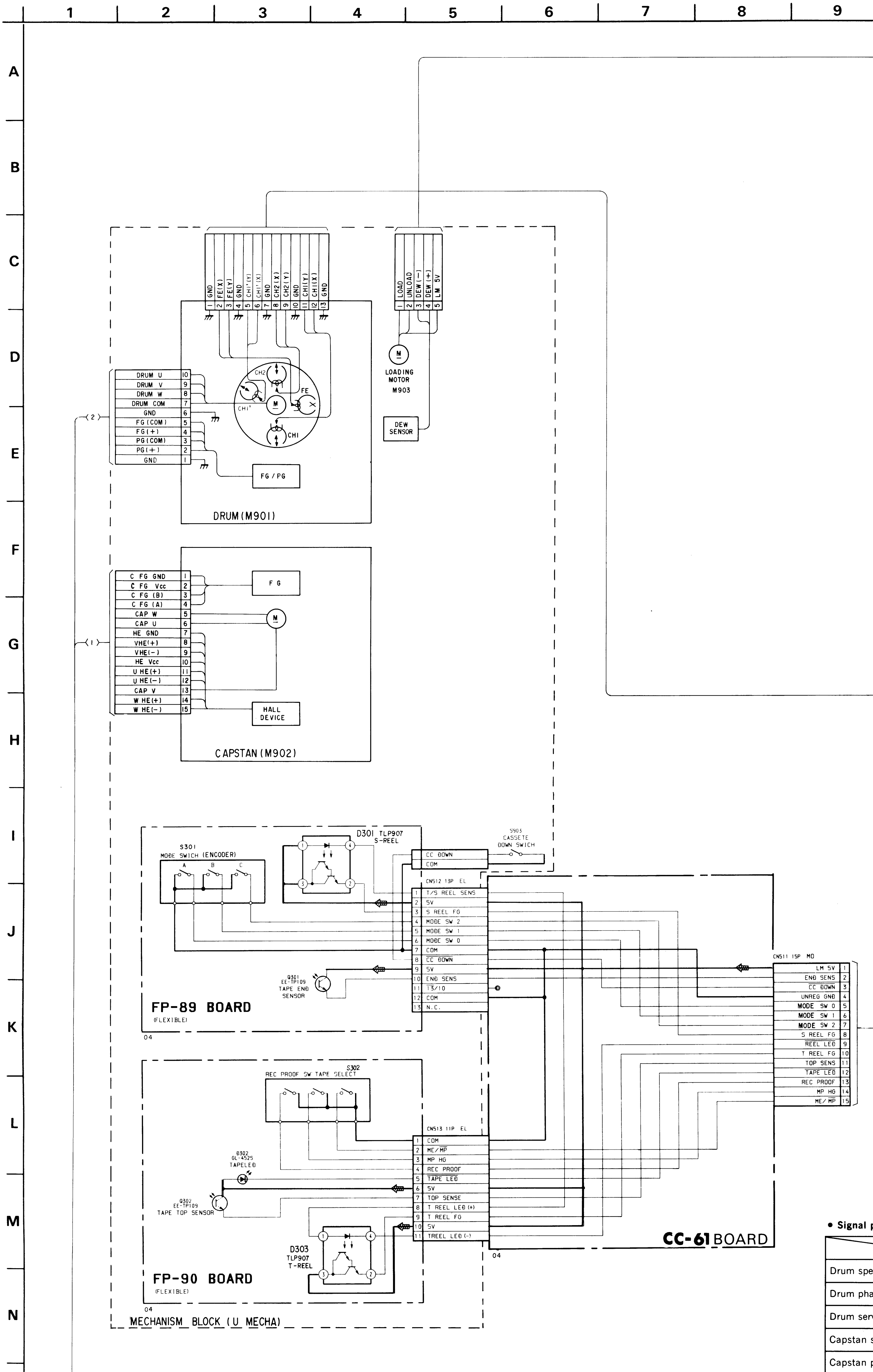
Q302	8-729-906-48 EE-TP109

CC-61 (RELAY), SS-136 (SERVO/SYSTEM CONTROL),FP-89, FP-90 (MECHADECK FLEXIBLE) SCHEMATIC DIAGRAM

—Ref. No. CC-61 and SS-136 BOARDS : 3000 series, FP-89 and FP-90 BOARDS : 8000 series—

SS-136 BOARD

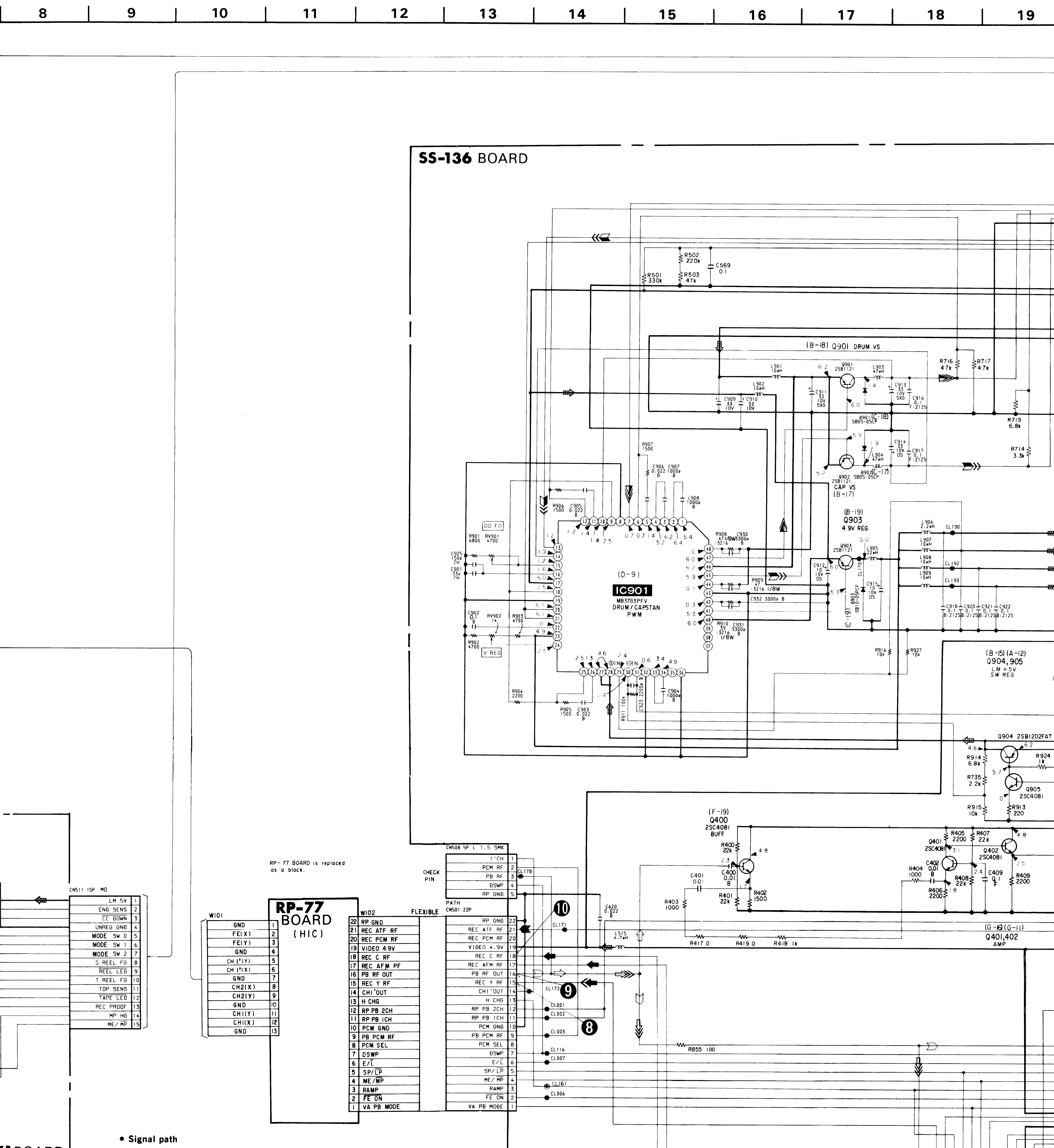

❶
4.8Vp-p
2V
IC501 ④ SWP ⑧⓪ RF SWP REC/PB
❷
16MHz
REC: 3Vp-p
PB: 2.2Vp-p
IC501 ㉞ 16M OUT ㉟ 16M IN REC/PB
❸
2.1Vp-p
H
IC501 (58) COMP SYNC REC/PB
❹
4.8Vp-p
2V
IC501 (60) DRUM FG REC/PB
❺
4.8Vp-p
3.2msec
IC501 (61) DRUM PG REC/PB
❻
4.8Vp-p
0.72msec
IC501 (62) (69) CAP FG REC/PB
❼
3Vp-p
5.86MHz
IC506 ⑭ OSC IN REC/PB
❽
V: 0.1V/div
H: 0.1μsec/div
CN501 ⑮ REC Y RF REC
❾
V: 0.2V/div
H: 0.1μsec/div
CN501 ⑯ PB RF OUT PB
❿
0.12Vp-p
H
CN501 ⑱ REC C RF REC


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
1 GND
2 FE(X)
3 FE(Y)
4 GND
5 CH1'(Y)
6 CH1'(X)
7 GND
8 CH2(X)
9 CH2(Y)
10 GND
11 CH1(Y)
12 CH1(X)
13 GND
1 LOAD
2 UNLOAD
3 DEW(−)
4 DEW(+)
5 LM 5V
M
LOADING MOTOR M903
DEW SENSOR
DRUM U 10
DRUM V 9
DRUM W 8
DRUM COM 7
GND 6
FG(COM) 5
FG(+) 4
PG(COM) 3
PG(+) 2
GND 1
(2)
CH2
CH1'
M
FE
CH1
FG/PG
DRUM(M901)
C FG GND 1
C FG Vcc 2
C FG (B) 3
C FG (A) 4
CAP W 5
CAP U 6
HE GND 7
VHE(+) 8
VHE(−) 9
HE Vcc 10
U HE(+) 11
U HE(−) 12
CAP V 13
W HE(+) 14
W HE(−) 15
(1)
FG
M
HALL DEVICE
CAPSTAN(M902)
S301
MODE SWICH (ENCODER)
A
B
C
D301 TLP907
S-REEL
S903
CASSETE DOWN SWICH
CC DOWN
COM
CN512 13P EL
1 T/S REEL SENS
2 5V
3 S REEL FG
4 MODE SW 2
5 MODE SW 1
6 MODE SW 0
7 COM
8 CC DOWN
9 5V
10 END SENS
11 13/10
12 COM
13 N.C.
Q301
EE-TP109
TAPE END SENSOR
FP-89 BOARD
(FLEXIBLE)
04
CN511 15P MO
LM 5V 1
END SENS 2
CC DOWN 3
UNREG GND 4
MODE SW 0 5
MODE SW 1 6
MODE SW 2 7
S REEL FG 8
REEL LED 9
T REEL FG 10
TOP SENS 11
TAPE LED 12
REC PROOF 13
MP HG 14
ME/MP 15
S302
REC PROOF SW TAPE SELECT
CN513 11P EL
1 COM
2 ME/MP
3 MP HG
4 REC PROOF
5 TAPE LED
6 5V
7 TOP SENSE
8 T REEL LED (+)
9 T REEL FG
10 5V
11 TREEL LED (−)
D302
GL-452S
TAPELED
Q302
EE-TP109
TAPE TOP SENSOR
D303
TLP907
T-REEL
FP-90 BOARD
(FLEXIBLE)
04
04
CC-61 BOARD
MECHANISM BLOCK (U MECHA)

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

• Signal p

Drum spe
Drum pha
Drum ser
Capstan s
Capstan p
Capstan s
Ref.signal


8
9
10
11
12
13
14
15
16
17
18
19
SS-136 BOARD
R502 220k
C569 0.1
R501 330k
R503 47k
(B-18) Q901 DRUM VS
L901 10μH
Q901 2SB1121
L903 47μH
L902 10μH
C909 33 10V
C910 33 10V
C911 33 10V SXG
C913 33 10V SXG
C916 0.1 F:2125
D901 (C-18) SB05-05CP
R716 4.7k
R717 4.7k
R715 6.8k
R714 3.3k
R907 1500
C906 0.022 B
C907 1000p B
C908 1000p B
L904 47μH
C914 33 10V OS
C917 0.1 F:2125
Q902 2SB1121 CAP VS (B-17)
D902 (C-17) SB05-05CP
R906 1500
C905 0.022 B
DD FG
R901 6800
RV901 4700
C925 150p CH
C901 33p CH
(D-9)
IC901
MB3783PFV
DRUM/CAPSTAN
PWM
R908 47
C930 3300p B
R909 47
C932 3300p B
R910 39
C931 3300p B
(B-19) Q903 4.9V REG
Q903 2SB1121
L905 22μH
C912 10 10V OS
C915 10 10V OS
D903 SB10-05CP
L906 2.2μH
L907 10μH
L908 10μH
L909 10μH
CL190
CL192
CL193
C918 0.1
C920 0.1
C921 0.1
C922 0.1
C902 0.1 B
RV902 1k
R903 4700
R902 4700
V REG
R904 2200
R905 1500
C903 0.022 B
R911 100k
C923 2200p B
C904 1000p B
R916 10k
R927 10k
(B-15) (A-12) Q904,905 LM +5V SW REG
Q904 2SB1202FAT
R914 6.8k
R924 1k
R735 2.2k
Q905 2SC4081
R915 10k
R913 220
(F-19) Q400 2SC4081 BUFF
R400 22k
C401 0.01
C400 0.01 B
R401 22k
R402 1500
R403 1000
R405 2200
R407 22k
Q401 2SC4081
Q402 2SC4081
C402 0.01 B
R404 1000
R408 22k
R406 2200
C409 0.1
R409 2200
(G-18) (G-11) Q401,402 AMP
C620 0.022 B
L515 4.7μH
R417 0
R419 0
R418 1k
R855 100
CN508 5P L 1.5 SMK
1 CH
PCM RF
PB RF
DSWP
RP GND
CHECK PIN
CL178
PATH
CN501 22P
FLEXIBLE
RP-77 BOARD is replaced as a block.
RP-77 BOARD (HIC)
W101
GND
FE(X)
FE(Y)
GND
CH 1'(Y)
CH 1'(X)
GND
CH2(X)
CH2(Y)
GND
CH1(Y)
CH1(X)
GND
W102
22 RP GND
21 REC ATF RF
20 REC PCM RF
19 VIDEO 4.9V
18 REC C RF
17 REC AFM RF
16 PB RF OUT
15 REC Y RF
14 CH1'OUT
13 H CHG
12 RP PB 2CH
11 RP PB 1CH
10 PCM GND
9 PB PCM RF
8 PCM SEL
7 DSWP
6 E/L
5 SP/LP
4 ME/MP
3 RAMP
2 FE ON
1 VA PB MODE
CL171
CL172
CL001
CL002
CL003
CL116
CL007
CL161
CL006
⑩
⑨
⑧
CN511 15P MO
LM 5V
END SENS
CC DOWN
UNREG GND
MODE SW 0
MODE SW 1
MODE SW 2
S REEL FG
REEL LED
T REEL FG
TOP SENS
TAPE LED
REC PROOF
MP HG
ME/MP
61 BOARD

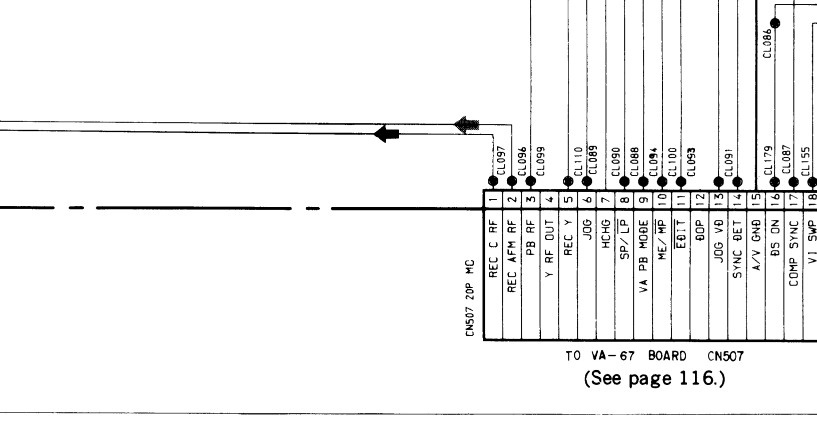
• Signal path

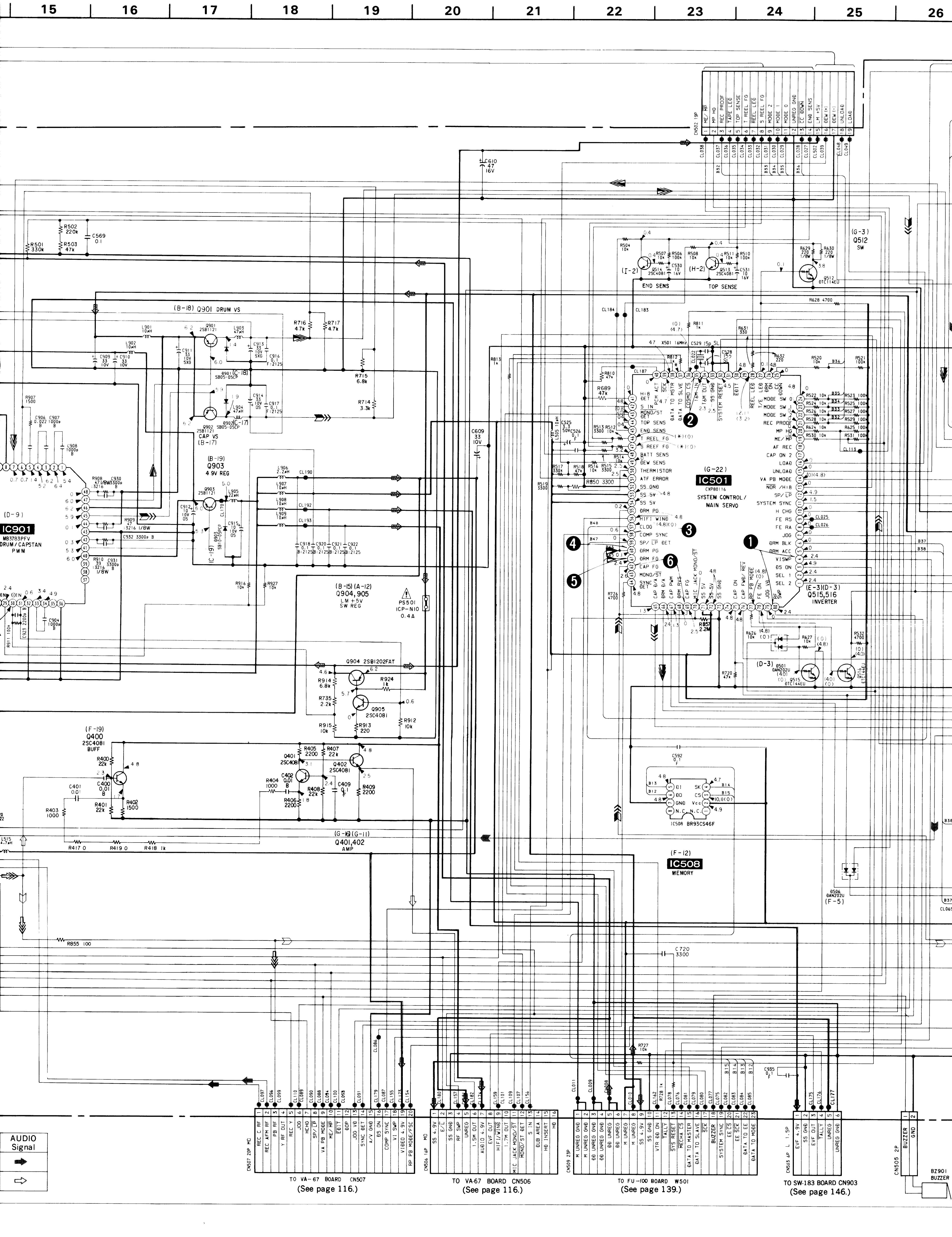
	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷	
Drum servo(speed and phase)		⋙	
Capstan speed servo		⊳	
Capstan phase servo	➤»	⊳»	▷»
Capstan servo(speed and phase)		⊳⋙	
Ref.signal	➤	⊳	▷

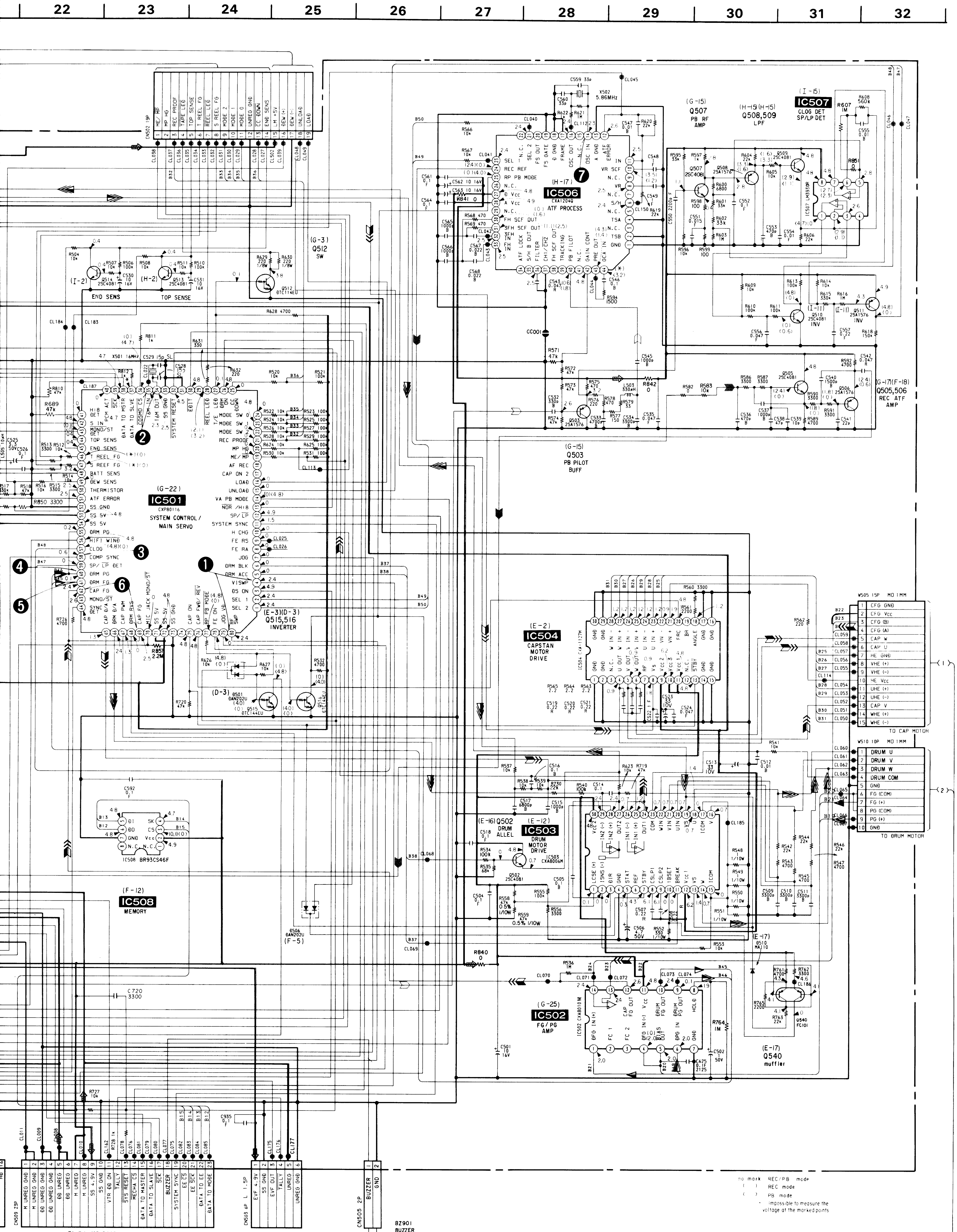
by mark ⚠ or dotted
l for safety.
per specified.

• Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡⋙	➡
PB	⇨	⇨»	⇨⋙	⇨


CL097
CL096
CL095
CL110
CL089
CL088
CL094
CL100
CL093
CL091
CL179
CL087
CL155
CL086
CN507 20P MC
REC C RF
REC AFM RF
PB RF
Y RF OUT
REC Y
JOG
HCHG
SP/LP
VA PB MODE
ME/MP
EDIT
BOP
JOG VD
SYNC DET
A/V GND
BS ON
COMP SYNC
V1 SWP
TO VA-67 BOARD CN507
(See page 116.)

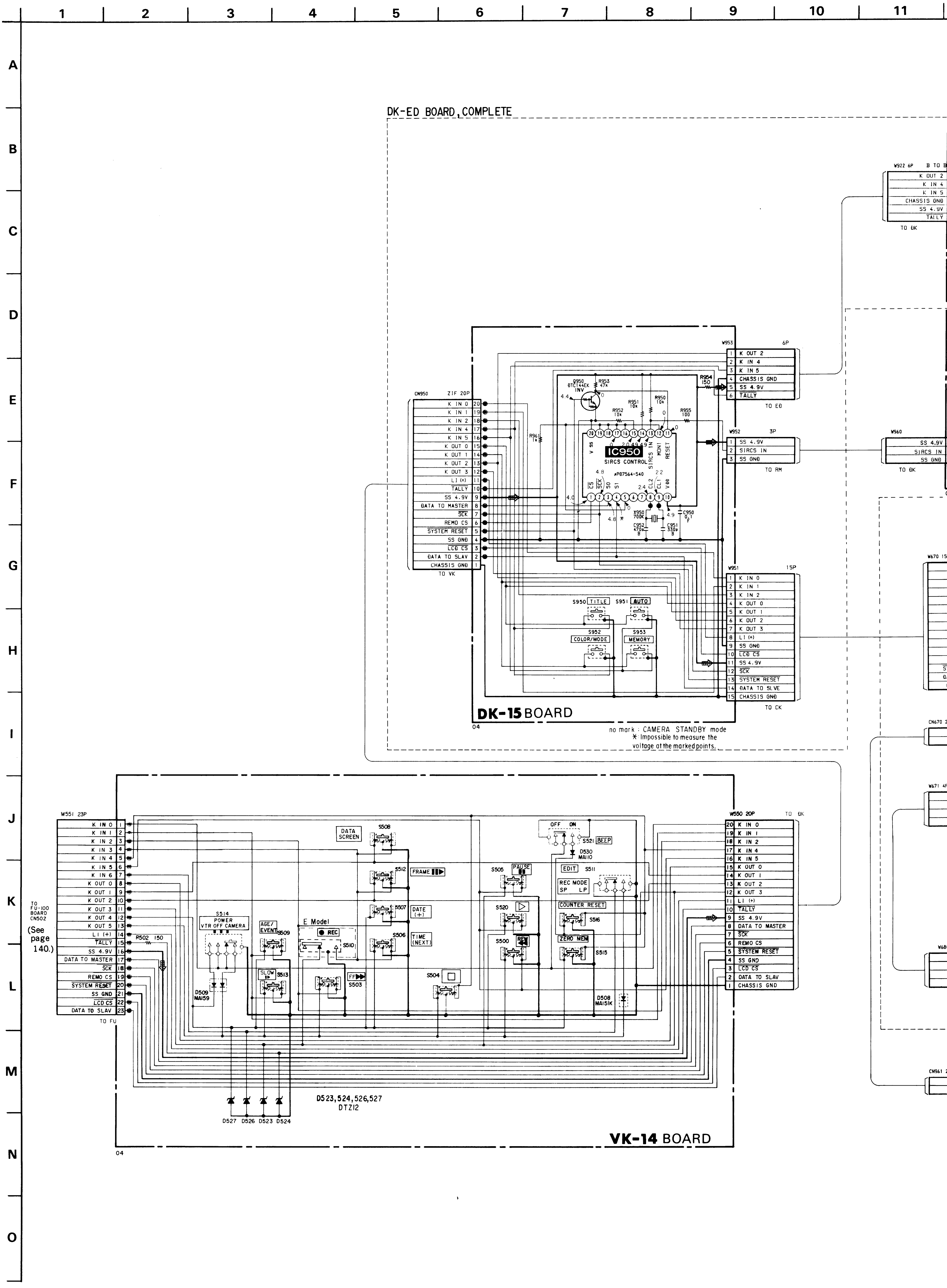
15
16
17
18
19
20
21
22
23
24
25
26
CN502 19P
ME/MP
MP HG
REC PROOF
TAPE LED
TOP SENSE
T REEL FG
T REEL LED
S REEL FG
MODE 2
MODE 1
MODE 0
UNREG GND
CC DOWN
END SENS
LM +5V
BEW (+)
BEW (-)
UNLOAD
LOAD
C610 47 16V
R502 220k
R501 330k
R503 47k
C569 0.1
(B-18) Q901 DRUM VS
Q901 2SB1121
B901 SB05-05CP (C-18)
Q902 2SB1121
B902 SB05-05CP (C-17)
CAP VS (B-17)
(B-19) Q903 4.9V REG
Q903 2SB1121
R716 47k
R717 4.7k
R715 6.8k
R714 3.3k
C609 33 10V
(D-9)
IC901
MB3783PFV
DRUM/CAPSTAN PWM
(B-15) (A-12) Q904,905 LM +5V SW REG
PS501 ICP-N10 0.4A
Q904 2SB1202FAT
Q905 2SC4081
(F-19) Q400 2SC4081 BUFF
Q401 2SC4081
Q402 2SC4081
(G-18) (G-11) Q401,402 AMP
R417 0
R419 0
R418 1k
R855 100
(I-2) Q514 2SC4081 END SENS
(H-2) Q513 2SC4081 TOP SENSE
(G-3) Q512 SW
Q512 DTC114EU
(G-22)
IC501
CXP80116
SYSTEM CONTROL/ MAIN SERVO
X501 16MHz
(E-3)(D-3) Q515,516 INVERTER
(D-3) D501 DAN202U
Q515 DTC114EU
Q516 DTC114EU
C592 0.1 F
IC508 BR93CS46F
(F-12)
IC508
MEMORY
D506 DAN202U (F-5)
C720 3300
R727 10k
C935 0.1 F
❶
❷
❸
❹
❺
❻
CN507 20P MC
REC C RF
REC AFM RF
PB RF
Y RF OUT
REC Y
JOG
HCHG
SP/LP
VA PB MODE
ME/MP
EDIT
BOP
JOG VE
SYNC DET
A/V GND
COMP SYNC
V1 SWP
VIDEO 4.9V
RP PB MODE/FSC
TO VA-67 BOARD CN507
(See page 116.)
CN506 16P MD
SS 4.9V
E/L
SS GND
RF SWP
UNREG
1.5M OUT
AUDIO 4.9V
EVF OUT
HIFI/WIND
1.7M OUT
MIC JACK MONO/ST
MONO/ST
S IN
DUB AREA
H0 INSERT
H0
TO VA-67 BOARD CN506
(See page 116.)
CN509 23P
M UNREG GND
M UNREG GND
BB UNREG GND
BB UNREG GND
BB UNREG
BB UNREG
M UNREG
M UNREG
SS 4.9V
SS GND
VTR BB ON
TALLY
SYS RESET
MECHA CS
DATA TO MASTER
DATA TO SLAVE
SCK
BUZZER
SYSTEM SYNC
EE CS
EE SCK
DATA TO EE
DATA TO MODE
TO FU-100 BOARD W501
(See page 139.)
CN503 6P L 1.5P
EVF 4.9V
SS GND
EVF OUT
TALLY
UNREG
UNREG GND
TO SW-183 BOARD CN903
(See page 146.)
CN505 2P
BUZZER
GND
BZ901 BUZZER
AUDIO Signal


22
23
24
25
26
27
28
29
30
31
32
CN502 19P
ME/MP
MP HG
REC PROOF
TAPE LED
TOP SENSE
T REEL FG
T REEL LED
S REEL FG
MODE 2
MODE 1
MODE 0
UNREG GND
CC DOWN
END SENS
LM +5V
DEW (+)
DEW (-)
UNLOAD
LOAD
(H-17)
IC506
CXA1204Q
ATF PROCESS
X502
5.86MHz
(G-15)
Q507
PB RF
AMP
(H-15)(H-15)
Q508,509
LPF
(I-15)
IC507
CLOG DET
SP/LP DET
(G-3)
Q512
SW
(I-2)
Q514
END SENS
(H-2)
Q513
TOP SENSE
(I-11)
Q510
INV
(I-11)
Q511
INV
(G-17)(F-18)
Q505,506
REC ATF
AMP
(G-15)
Q503
PB PILOT
BUFF
(G-22)
IC501
CXP80116
SYSTEM CONTROL / MAIN SERVO
X501 16MHz
(E-3)(D-3)
Q515,516
INVERTER
(D-3)
D501
(E-2)
IC504
CAPSTAN
MOTOR
DRIVE
W505 15P
CFG GND
CFG Vcc
CFG (B)
CFG (A)
CAP W
CAP U
HE GND
VHE (+)
VHE (-)
HE Vcc
UHE (+)
UHE (-)
CAP V
WHE (+)
WHE (-)
TO CAP MOTOR
(1)
W510 10P
DRUM U
DRUM V
DRUM W
DRUM COM
GND
FG (COM)
FG (+)
PG (COM)
PG (+)
GND
TO DRUM MOTOR
(2)
(E-16) Q502
DRUM
ALLEL
(E-12)
IC503
DRUM
MOTOR
DRIVE
IC503 CXA8006M
(F-12)
IC508
MEMORY
IC508 BR93CS46F
(G-25)
IC502
FG/PG
AMP
IC502 CXA8010M
(E-17)
D510
(E-17)
Q540
muffler
D506
(F-5)
CN509 23P
M UNREG GND
M UNREG GND
BB UNREG GND
BB UNREG GND
BB UNREG
M UNREG
M UNREG
SS 4.9V
VTR BB ON
TALLY
SYS RESET
DATA TO MASTER
MECHA CS
DATA TO SLAVE
SCK
BUZZER
SYSTEM SYNC
EE CS
EE SCK
DATA TO EE
DATA TO MODE
TO FU-100 BOARD W501
(See page 139.)
CN503 6P L 1.5P
EVF 4.9V
SS GND
EVF OUT
TALLY
UNREG
UNREG GND
TO SW-183 BOARD CN903
(See page 146.)
CN505 2P
BUZZER
GND
BZ901
BUZZER
❶
❷
❸
❹
❺
❻
❼

no mark REC/PB mode
( ) REC mode
⟨ ⟩ PB mode
* impossible to measure the voltage at the marked points

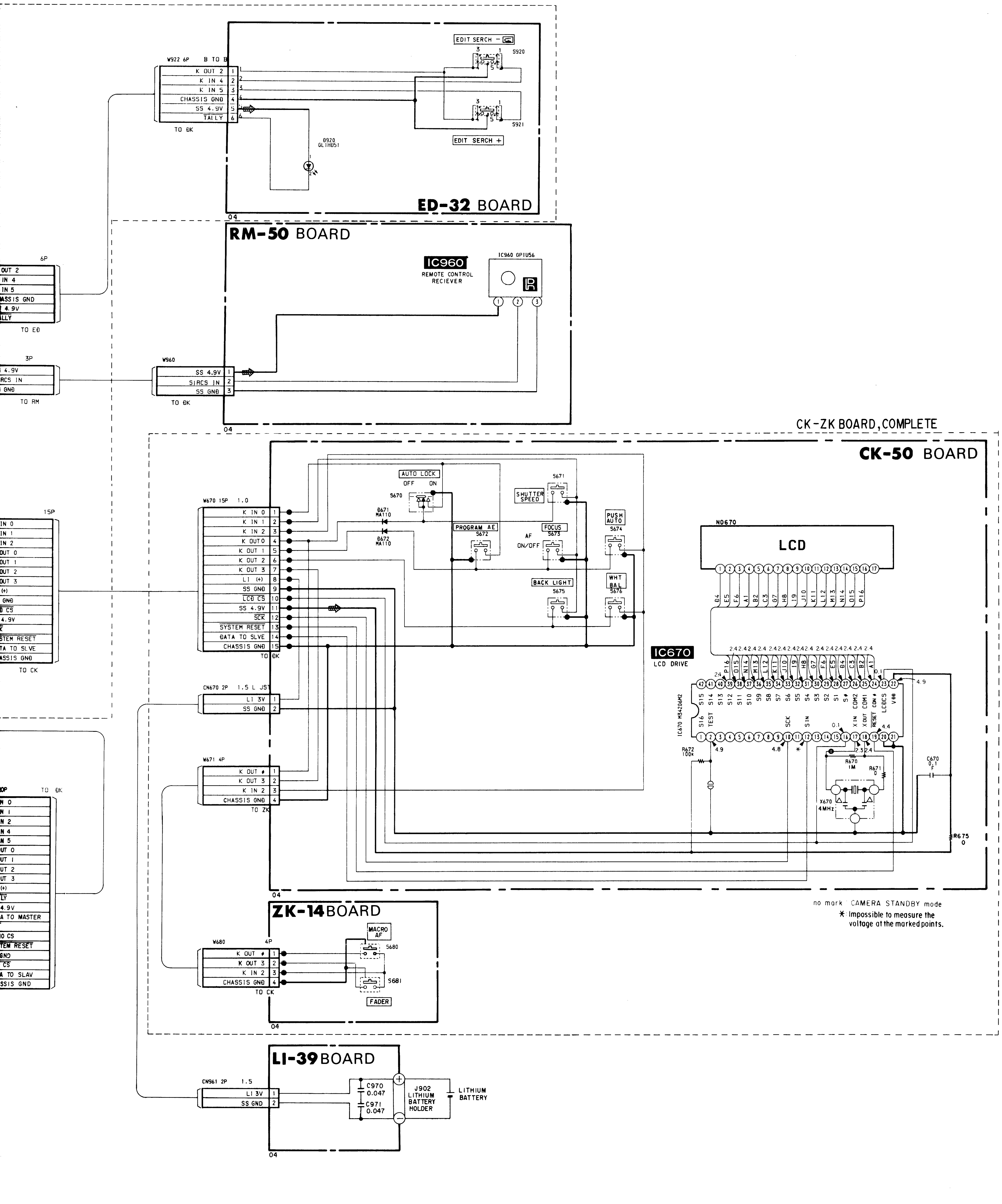
CK-50, DK-15, ED-32 (FUNCTION SWITCH), LI-39 (LITHIUM BATTERY TERMINAL), RM-50 (REMOTE CONTROL RECEIVER), VK-14 (FUNCTION SWITCH), ZK-14 (SWITCH) SCHE

—Ref. No. CK-50, DK-15, ED-32, LI-39, RM-50, VK-14 and ZK-14 BOARDS : 5000 series—



DK-ED BOARD, COMPLETE
DK-15 BOARD
VK-14 BOARD
IC950
SIRCS CONTROL
μPD7564-540
CN950 ZIF 20P
TO VK
W953 6P
TO ED
W952 3P
TO RM
W951 15P
TO CK
W922 6P B TO B
TO DK
W960
S950 TITLE
S951 AUTO
S952 COLOR/MODE
S953 MEMORY
Q950 DTC144EK INV
X950 700k
no mark : CAMERA STANDBY mode
✱ : Impossible to measure the voltage at the marked points.
W551 23P
TO FU-100 BOARD CN502
(See page 140.)
TO FU
W550 20P
TO DK
S508 DATA SCREEN
S512 FRAME
S507 DATE (+)
S506 TIME (NEXT)
S514 POWER VTR OFF CAMERA
S509 AGE/EVENT
E Model
S510 REC
S513 SLOW
S503 FF
S504
S505 PAUSE
S520
S500 REW
S521 BEEP
D530 MA110
S511 REC MODE SP LP
S516 COUNTER RESET
S515 ZERO MEM
D508 MA151K
D509 MA159
D523,524,526,527 DTZ12
R502 150

10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20


ED-32 BOARD
W922 6P B TO B
K OUT 2
K IN 4
K IN 5
CHASSIS GND
SS 4.9V
TALLY
TO EK
EDIT SERCH −
S920
S921
EDIT SERCH +
D920 GL1HD51
04
RM-50 BOARD
IC960
REMOTE CONTROL RECIEVER
IC960 GP1U56
W960
SS 4.9V
SIRCS IN
SS GND
TO EK
TO ED
TO RM
6P
3P
15P
CK-ZK BOARD, COMPLETE
CK-50 BOARD
W670 15P 1.0
K IN 0
K IN 1
K IN 2
K OUT 0
K OUT 1
K OUT 2
K OUT 3
LI (+)
SS GND
LCD CS
SS 4.9V
SCK
SYSTEM RESET
DATA TO SLVE
CHASSIS GND
TO EK
AUTO LOCK
OFF ON
S670
D671 MA110
D672 MA110
PROGRAM AE
S672
SHUTTER SPEED
S671
AF ON/OFF
FOCUS
S673
PUSH AUTO
S674
BACK LIGHT
S675
WHT BAL
S676
ND670
LCD
IC670
LCD DRIVE
IC670 M54268M2
R672 100k
R670 1M
R671 0
X670 4MHz
C670 0.1
R675 0
CN670 2P 1.5 L JST
LI 3V
SS GND
W671 4P
K OUT ∅
K OUT 3
K IN 2
CHASSIS GND
TO ZK
no mark CAMERA STANDBY mode
✻ Impossible to measure the voltage at the marked points.
ZK-14 BOARD
W680 4P
MACRO AF
S680
S681
FADER
TO CK
LI-39 BOARD
CN961 2P 1.5
LI 3V
SS GND
C970 0.047
C971 0.047
J902 LITHIUM BATTERY HOLDER
LITHIUM BATTERY
04
TO CK
TO EK

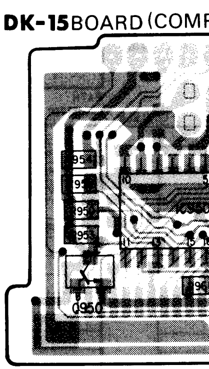
CK-50, D
—Ref. N

ZK-
(CO

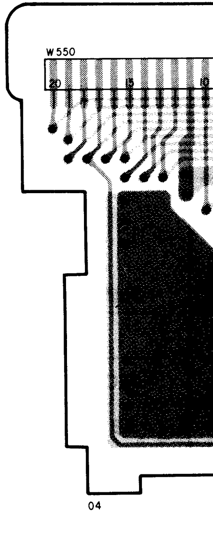
< IC >
IC950 8-759-14

< TRANSISTOR >
Q950 8-729-90

DK-15BOARD (COMP

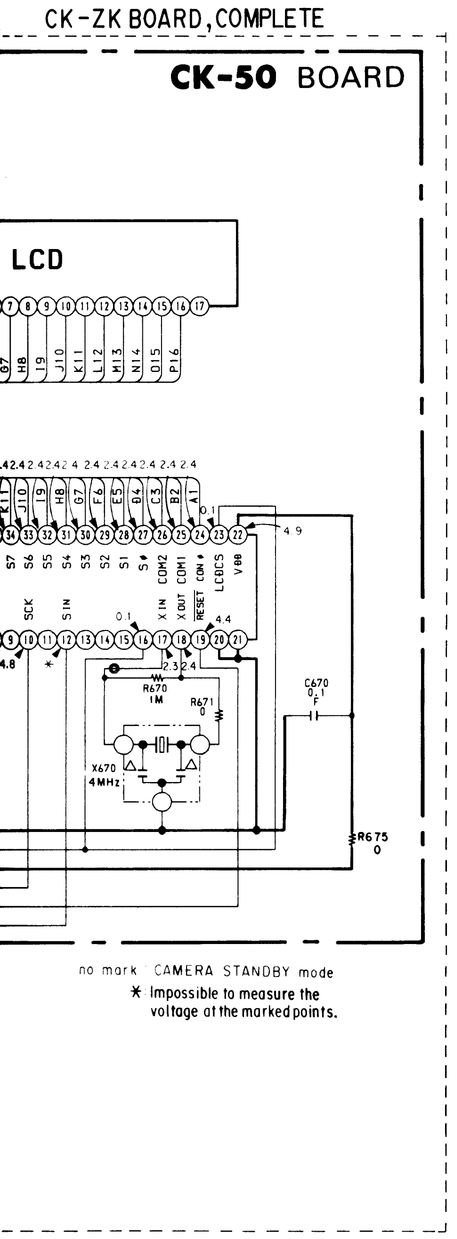


VK-14 BOARD (COM

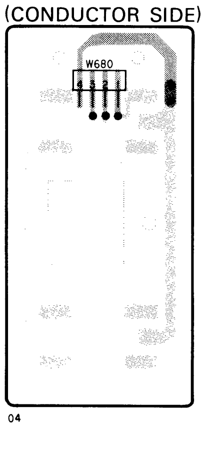


CK-50, DK-15, ED-32 (FUNCTION SWITCH), LI-39 (LITHIUM BATTERY TERMINAL), RM-50 (REMOTE CONTROL RECEIVER), VK-14 (FUNC

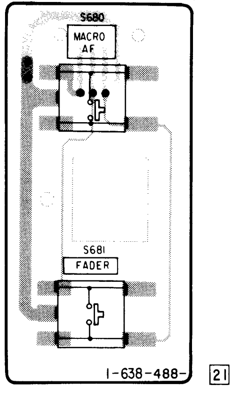
—Ref. No. CK-50, DK-15, ED-32, LI-39, RM-50, VK-14 and ZK-14 BOARDS : 5000 series—


CK-ZK BOARD, COMPLETE
CK-50 BOARD
LCD
SCK
SIN
XIN
XOUT
COM1
COM2
RESET
LCDCS
VDD
R670
1M
R671
0
C670
0.1
X670
4MHz
R675
0
no mark CAMERA STANDBY mode
* Impossible to measure the voltage at the marked points.

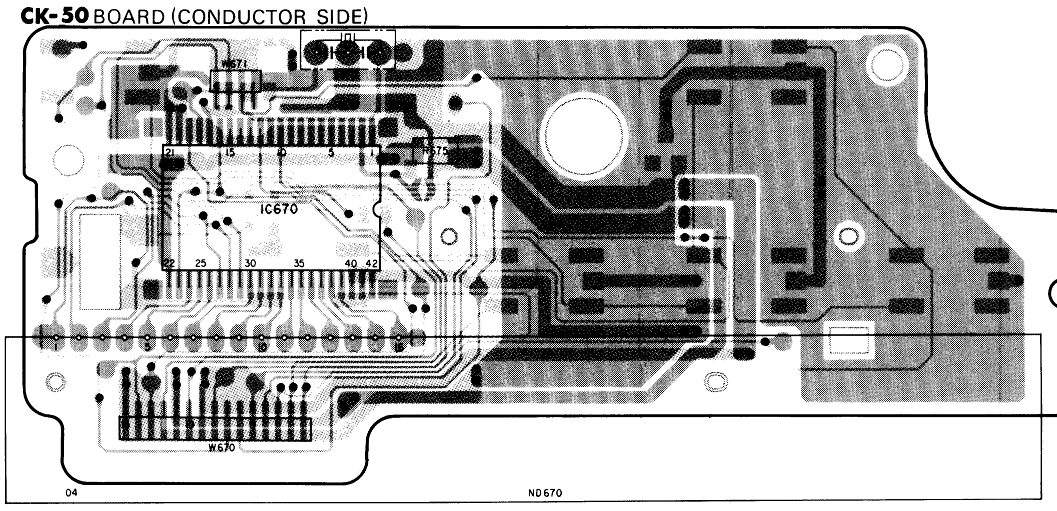
ZK-14 BOARD (CONDUCTOR SIDE)



ZK-14 BOARD (COMPONENT SIDE)


S680
MACRO AF
S681
FADER
1-638-488-
21

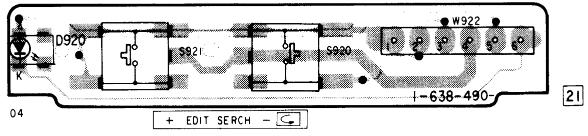
CK-50 BOARD (CONDUCTOR SIDE)


W671
IC670
W670
04
ND670

< IC >
IC950 8-759-145-63 uPD7564G-540

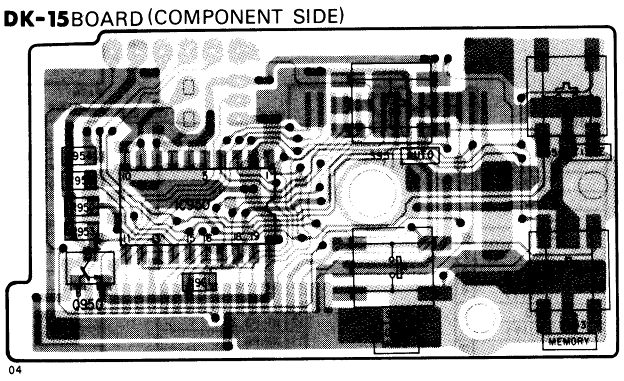
< TRANSISTOR >
Q950 8-729-901-01 DTC144EK

ED-32 BOARD (COMPONENT SIDE)

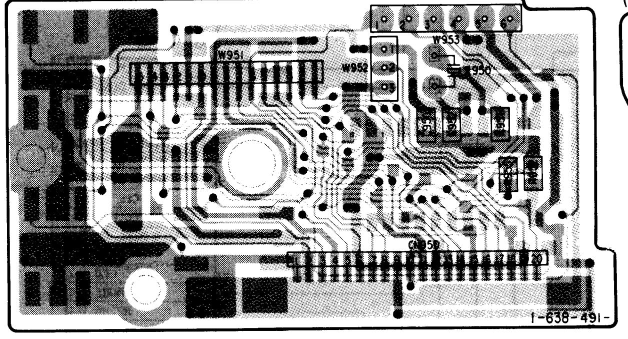

D920
S921
S920
W922
1-638-490-
+ EDIT SERCH −
04
21

< DIODE >
D920 8-719-941-34 GL1HD51

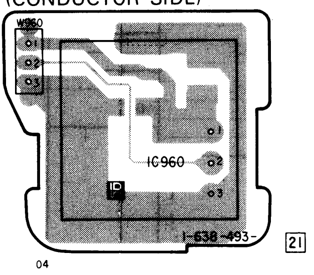
DK-15 BOARD (COMPONENT SIDE)


IC950
Q950
MEMORY
04

DK-15 BOARD (CONDUCTOR SIDE)

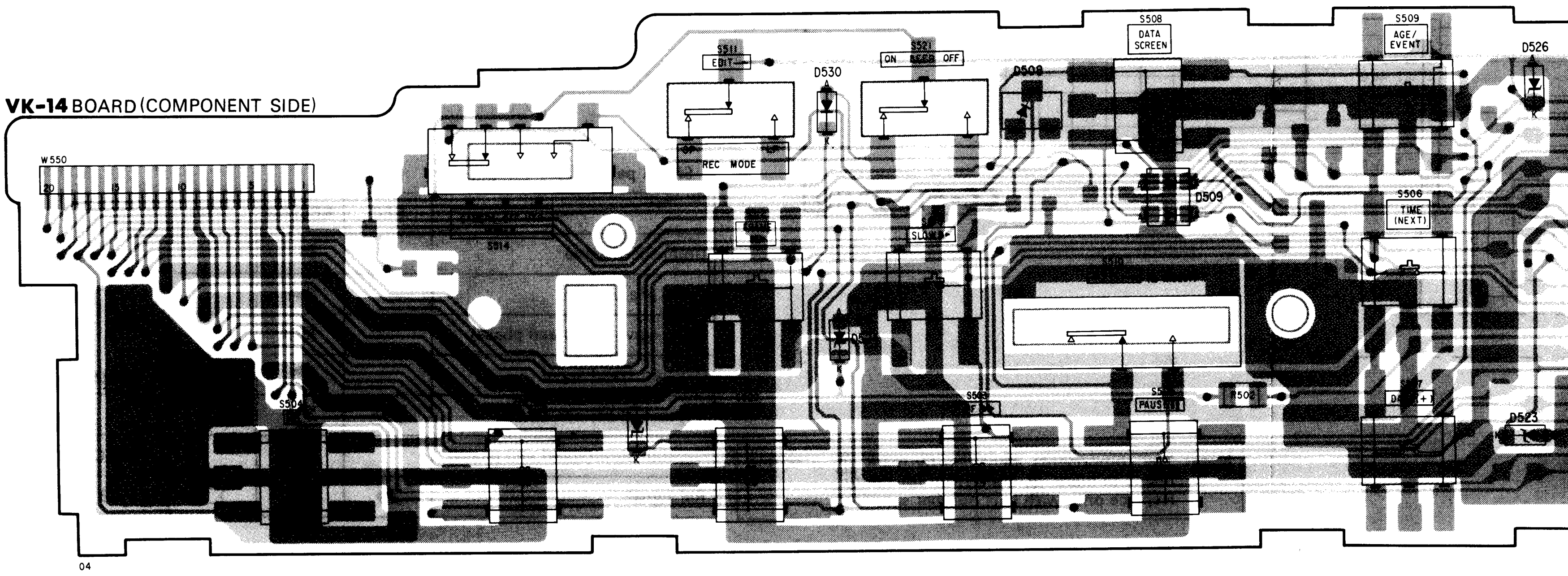

W951
W952
W953
1-638-491-

RM-50 BOARD (CONDUCTOR SIDE)


W960
IC960
1-638-493-
21
04

< IC >
IC960 8-749-921-76 GP1U56

VK-14 BOARD (COMPONENT SIDE)


W550
S511
EDIT
S521
ON BEEP OFF
D530
REC MODE
S508
DATA SCREEN
S509
AGE/EVENT
D526
D509
S506
TIME (NEXT)
S514
S510
S505
PAUSE
D523
04

, LI-39 (LITHIUM BATTERY TERMINAL), RM-50 (REMOTE CONTROL RECEIVER), VK-14 (FUNCTION SWITCH), ZK-14 (SWITCH) PRINTED WIRING BOARDS

/K-14 and ZK-14 BOARDS : 5000 series—

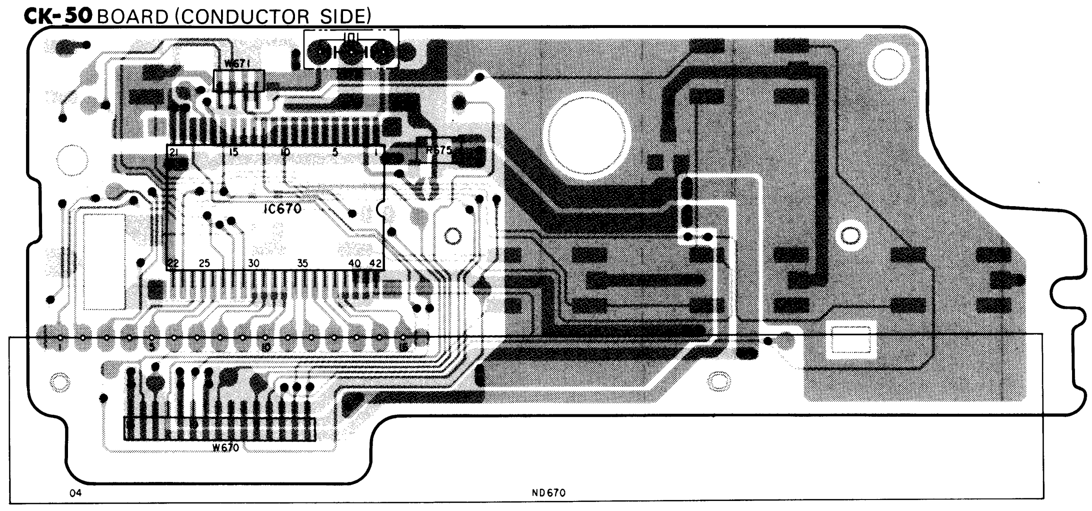
< DIODE >

D671	8-719-404-46	MA110
D672	8-719-404-46	MA110

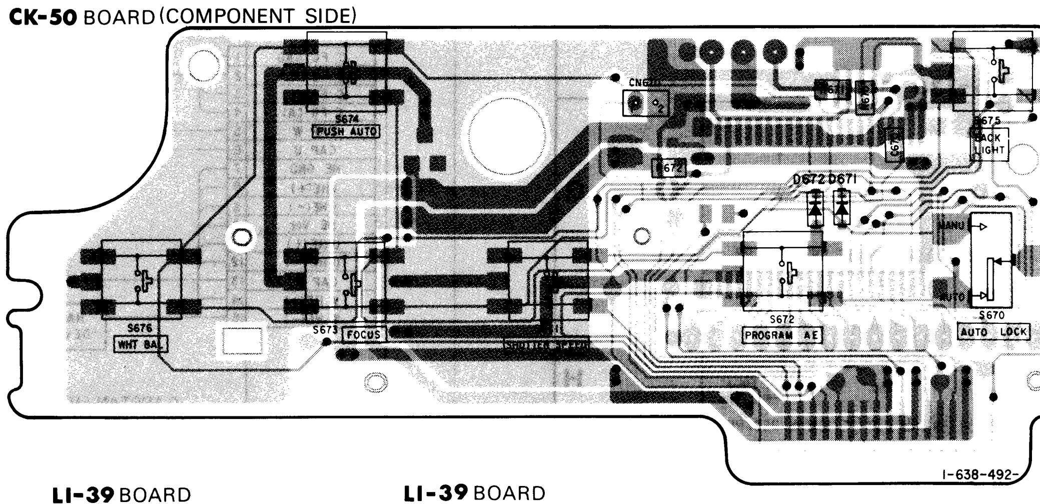
< IC >

IC670	8-759-634-72	M34206M2-109FP

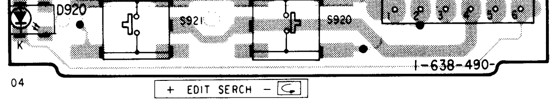
CK-50 BOARD (CONDUCTOR SIDE)


W671
IC670
W675
21
15
10
5
1
22
25
30
35
40
42
W670
04
ND670
21

CK-50 BOARD (COMPONENT SIDE)


CN671
S674
PUSH AUTO
S676
WHT BAL
S673
FOCUS
SHUTTER SPEED
D672
D672 D671
S675
BACK LIGHT
MANU
AUTO
S670
AUTO LOCK
S672
PROGRAM AE
1-638-492-

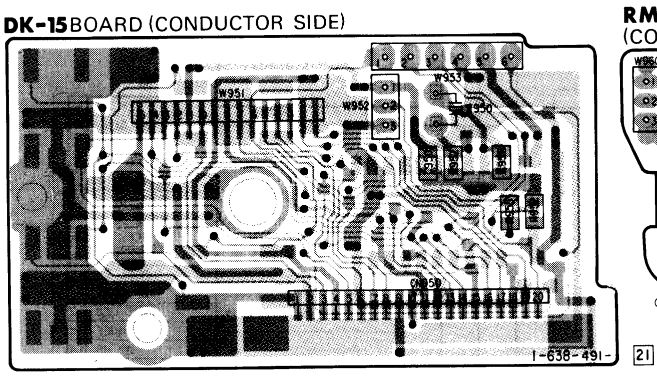
ED-32 BOARD (COMPONENT SIDE)


D920
K
S921
S920
W922
1-638-490-
21
04
+ EDIT SERCH −

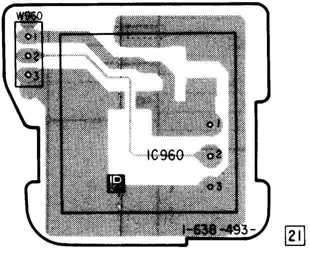
< DIODE >

D920	8-719-941-34	GL1HD51

DK-15 BOARD (CONDUCTOR SIDE)


W951
W952
W953
CN950
1-638-491-
21

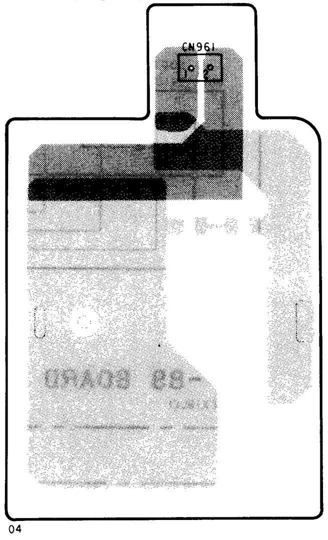
RM-50 BOARD
(CONDUCTOR SIDE)


W950
IC960
1-638-493-
21
04

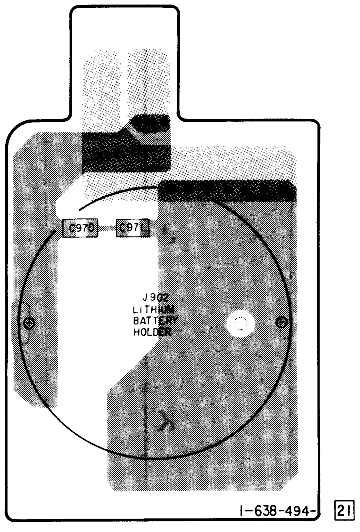
< IC >

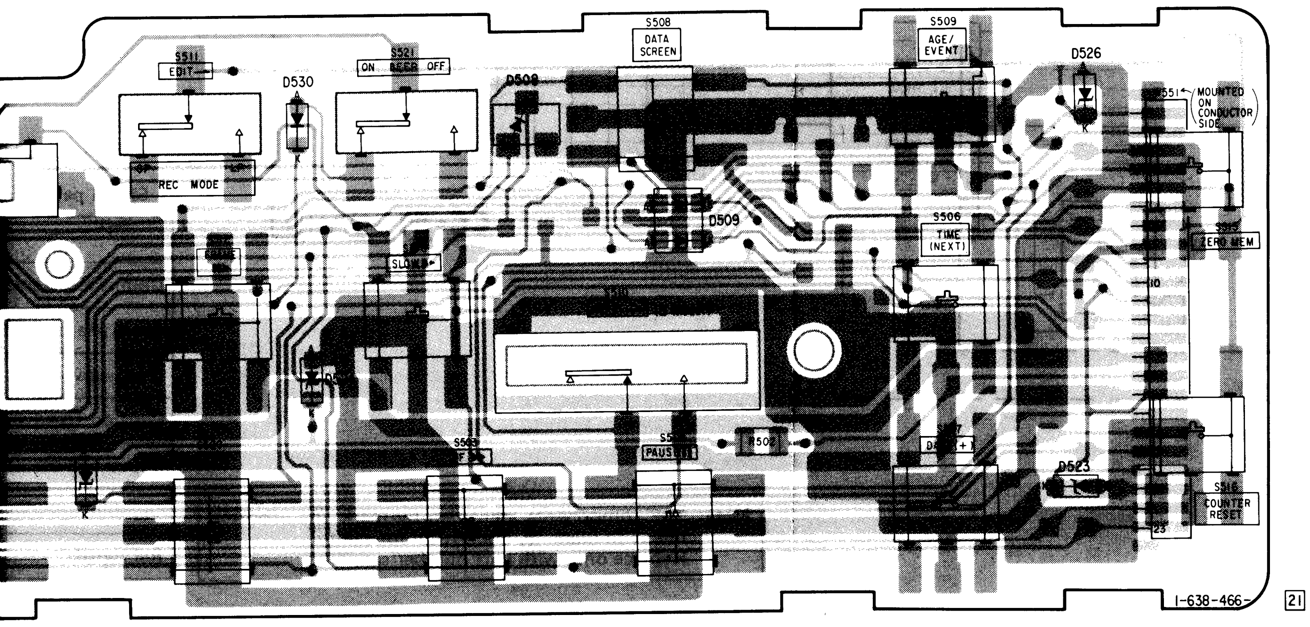
IC960	8-749-921-76	GP1U56

LI-39 BOARD
(CONDUCTOR SIDE)



LI-39 BOARD
(COMPONENT SIDE)


C970
C971
J902
LITHIUM BATTERY HOLDER
K
1-638-494-
21

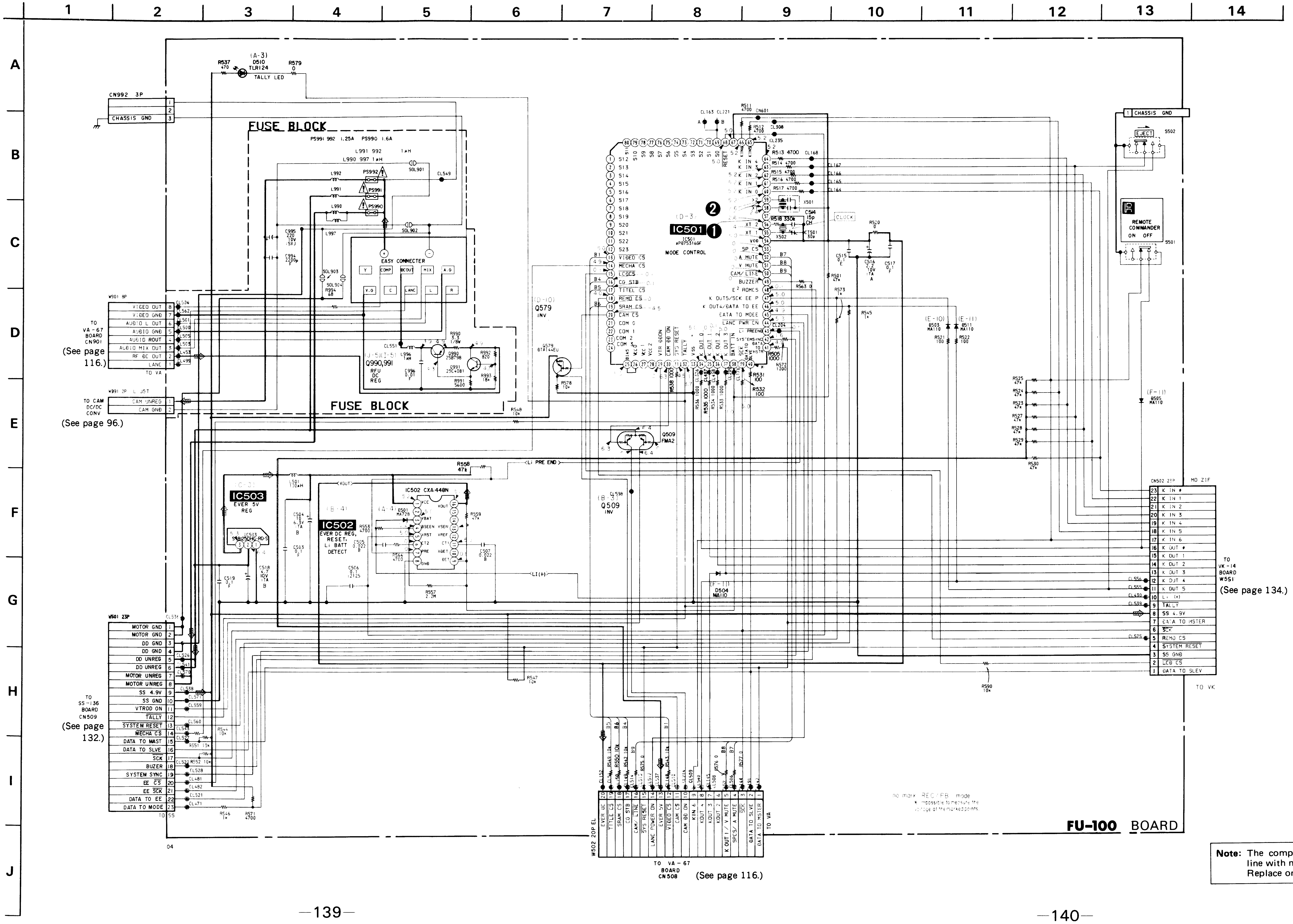

S511
EDIT
S521
ON BEEP OFF
D530
D508
REC MODE
S508
DATA SCREEN
S509
AGE/ EVENT
D526
S551 MOUNTED ON CONDUCTOR SIDE
D509
S506
TIME (NEXT)
ZERO MEM
SLOW
PAUSE
R502
D523
S516
COUNTER RESET
10
23
1-638-466-
21

< DIODE >

D508	8-719-420-33	MA151K
D509	8-719-940-45	DWA010
D523	8-719-977-34	DTZ12
D524	8-719-977-34	DTZ12
D526	8-719-977-34	DTZ12
D527	8-719-977-34	DTZ12
D530	8-719-404-46	MA110

FU-100 (MODE CONTROL, MAIN BATTERY TERMINAL) SCHEMATIC DIAGRAM

—Ref. No. FU-100 BOARD : 5000 series—

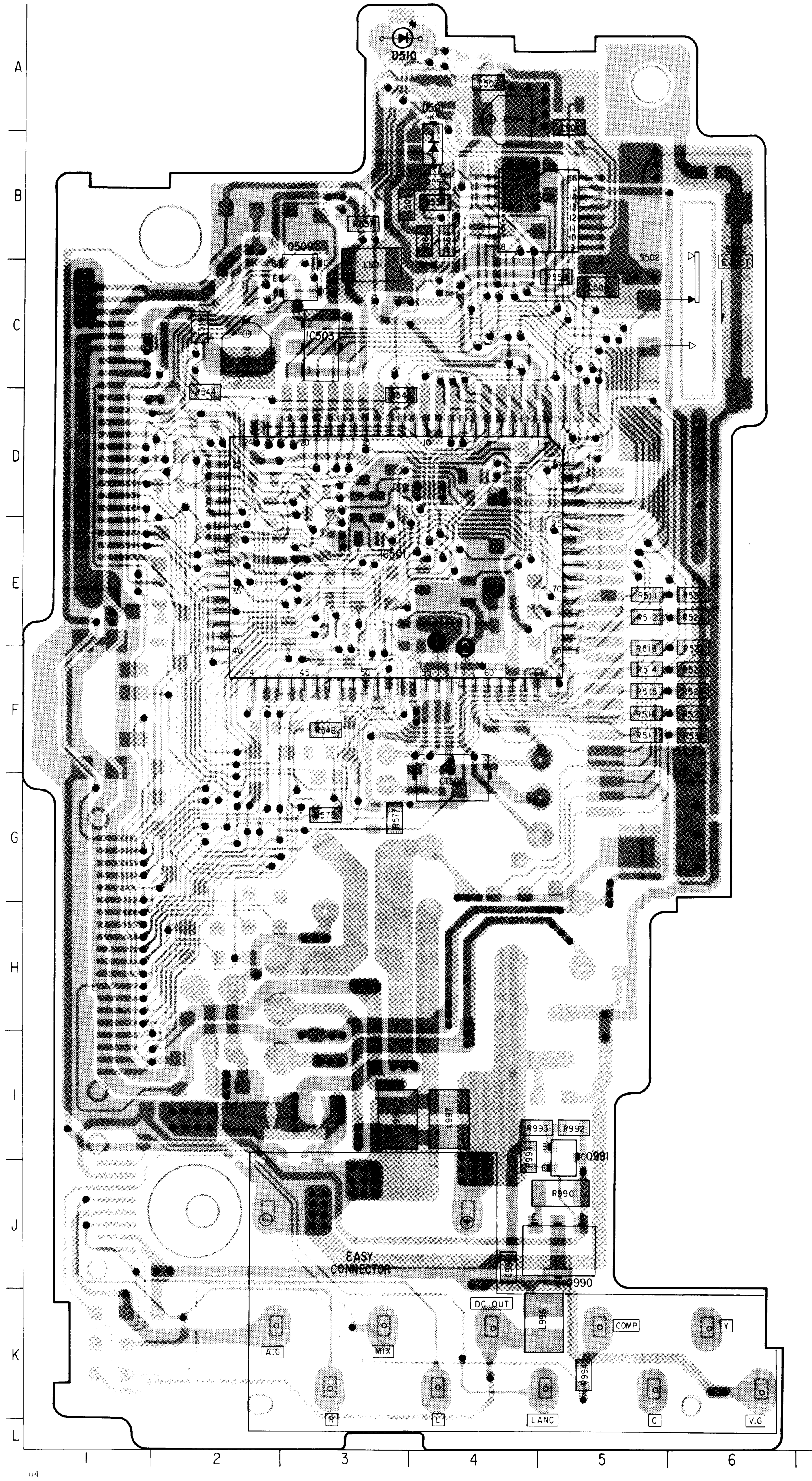

1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
J
FUSE BLOCK
FUSE BLOCK
PS991 992 1.25A PS990 1.6A
D510 TLR124 TALLY LED
R537 470
R579 0
CN992 3P
CHASSIS GND
W901 8P
VIDEO OUT
VIDEO GND
AUDIO L OUT
AUDIO GND
AUDIO ROUT
AUDIO MIX OUT
RF DC OUT
LANC
TO VA
TO VA-67 BOARD CN901
(See page 116.)
W991 2P
CAM UNREG
CAM GND
TO CAM DC/DC CONV
(See page 96.)
EASY CONNECTER
Q990,991 RFU DC REG
Q579 INV
IC501
μPD75316GF
MODE CONTROL
IC502 CXA-448N
IC502 EVER DC REG, RESET, Li BATT DETECT
IC503 EVER 5V REG
Q509 FMA2
Q509 INV
D504 MA110
W501 23P
MOTOR GND
MOTOR GND
DD GND
DD GND
DD UNREG
DD UNREG
MOTOR UNREG
MOTOR UNREG
SS 4.9V
SS GND
VTRDD ON
TALLY
SYSTEM RESET
MECHA CS
DATA TO MAST
DATA TO SLVE
SCK
BUZER
SYSTEM SYNC
EE CS
EE SCK
DATA TO EE
DATA TO MODE
TO SS
TO SS-136 BOARD CN509
(See page 132.)
W502 20P EL
EVER DC
TITLE CS
SRAM CS
CG STB
CAM/LINE
SYS RESET
LANC POWER ON
EVER 5V
VIDEO CS
CAM CS
CAM DD ON
KIN 6
KOUT 4
KOUT 3
KOUT 2
K OUT 1/V MUTE
SPCS/A MUTE
SCK
DATA TO SLVE
DATA TO MSTER
TO VA
TO VA-67 BOARD CN508
(See page 116.)
CHASSIS GND
EJECT S502
REMOTE COMMANDER ON OFF S501
CN502 23P
K IN 0
K IN 1
K IN 2
K IN 3
K IN 4
K IN 5
K IN 6
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K OUT 4
K OUT 5
Li (+)
TALLY
SS 4.9V
DATA TO MSTER
SCK
REMO CS
SYSTEM RESET
SS GND
LCD CS
DATA TO SLEV
TO VK
TO VK-14 BOARD W551
(See page 134.)
no mark : REC/PB mode
FU-100 BOARD

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

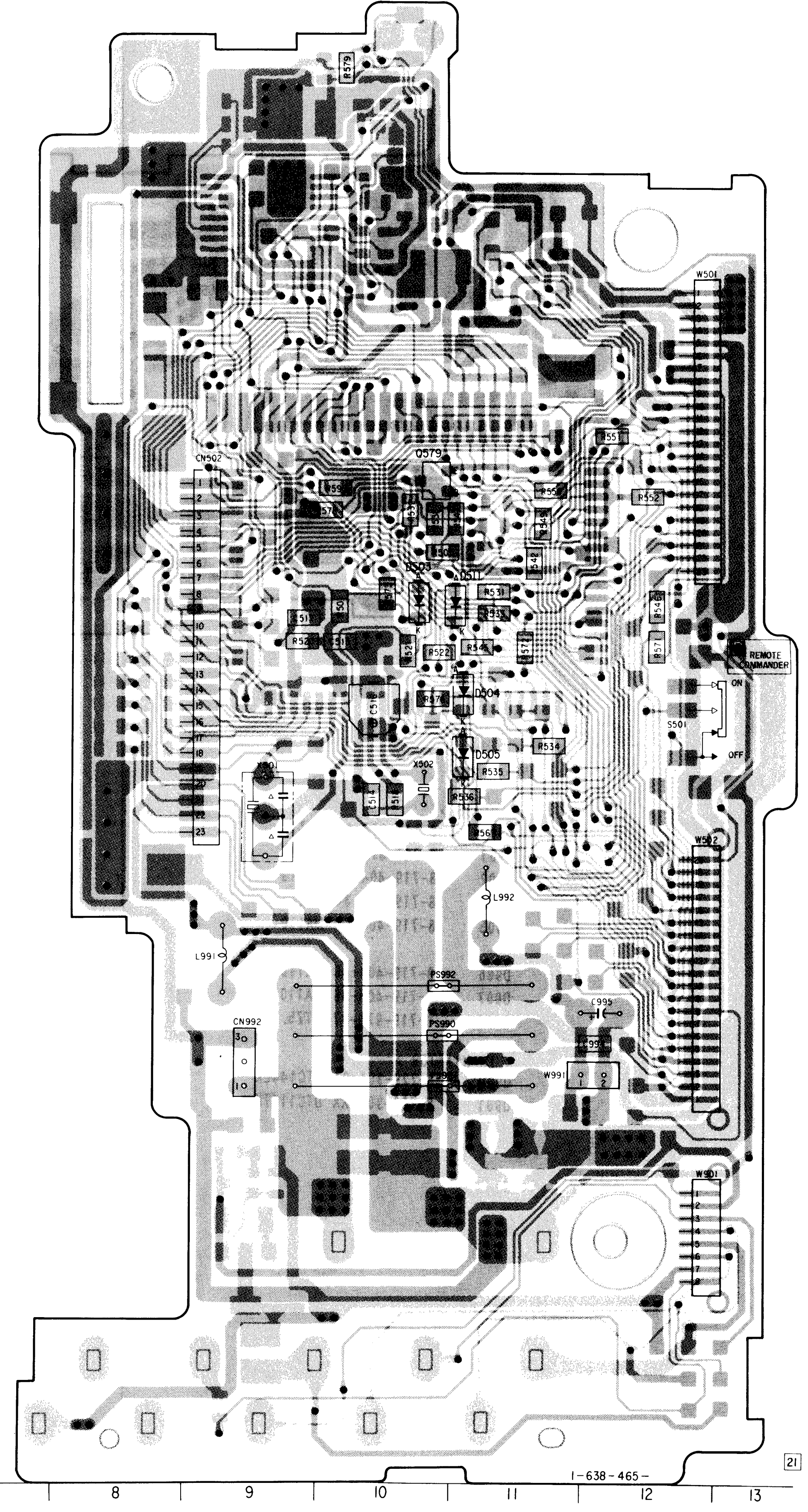
FU-100 (MODE CONTROL, MAIN BATTERY TERMINAL) PRINTED WIRING BOARD

—Ref. No. FU-100 BOARD : 5000 series—

FU-100 BOARD (COMPONENT SIDE)

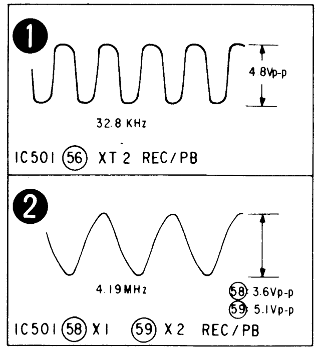

A
B
C
D
E
F
G
H
I
J
K
L
1
2
3
4
5
6
D510
D501
IC505
L501
Q509
R544
R548
R575
R577
IC501
S502
EJECT
R511
R512
R513
R514
R515
R516
R517
R993
R992
R991
Q991
R990
EASY CONNECTOR
Q990
DC OUT
A.G
MIX
COMP
Y
R
L
LANC
C
V.G

FU-100 BOARD (CONDUCTOR SIDE)


7
8
9
10
11
12
13
R579
W501
CN502
Q579
D503
D511
D504
D505
R531
R534
R535
X502
REMOTE COMMANDER
ON
OFF
S501
W502
L992
L991
PS992
PS990
CN992
C995
W991
W901
1-638-465-
21

< DIODE >		
D501	8-719-421-27	MA728
D503	8-719-404-46	MA110
D504	8-719-404-46	MA110
D505	8-719-404-46	MA110
D510	8-719-812-41	TLR124, RED
D511	8-719-404-46	MA110
< IC >		
IC501	8-759-154-18	uPD75316GF-116-3B9
IC502	8-759-511-22	CXA1448N-E2
IC503	8-759-937-54	S-81250HG-RD-S
< TRANSISTOR >		
Q509	8-729-904-20	FMA2
Q579	8-729-905-12	DTA144EU
Q990	8-729-101-07	2SB798-DK
Q991	8-729-905-35	2SC4081-R

FU - 100 BOARD



onents identified by mark ⚠ or dotted
ark ⚠ are critical for safety.
ly with part number specified.

MC-76 (MIC), SW-183 (SWITCH, JACK) PRINTED WIRING BOARDS

—Ref. No. MC-76 and SW-183 BOARDS : 4000 series—

< DIODE >

D652	8-719-106-43	RD9. 1M-B1
D655	8-719-404-46	MA110

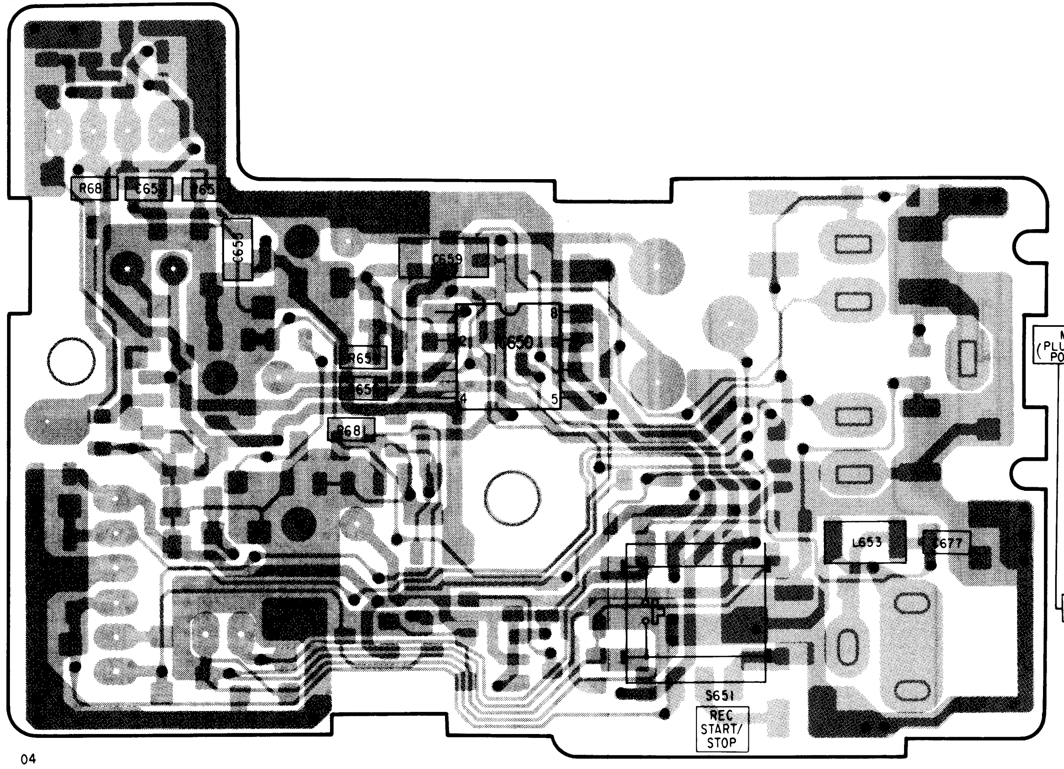
< IC >

IC650	8-759-822-37	LA7293M-TE-L

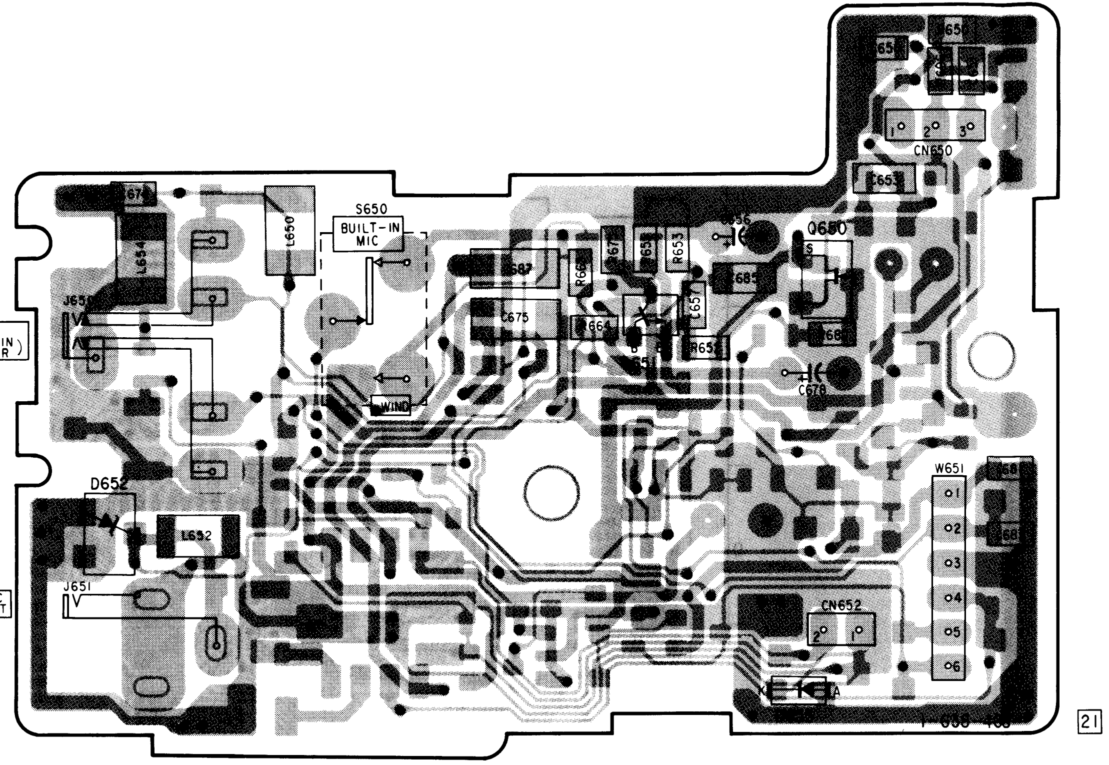
< TRANSISTOR >

Q650	8-729-109-44	2SK94
Q651	8-729-905-35	2SC4081-R

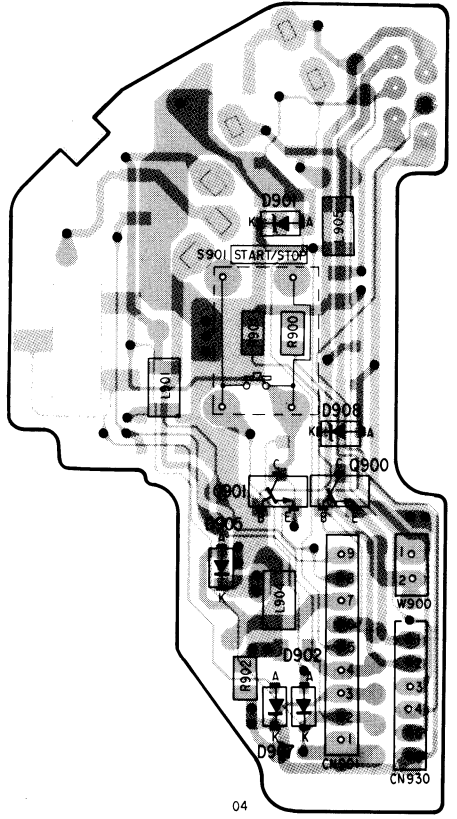
MC-76 BOARD(COMPONENT SIDE)


R681
C653
L655
C659
IC650
R652
R651
R681
L653
C677
S651
REC START/ STOP
04

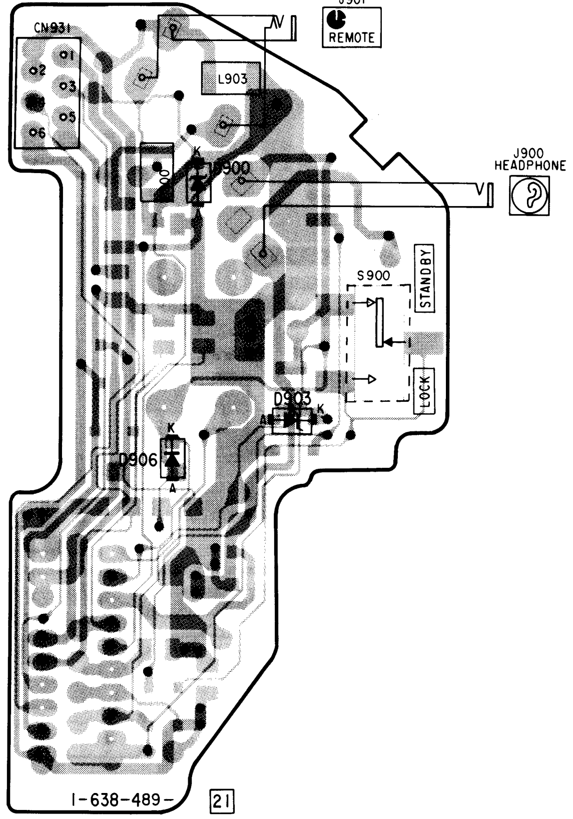
MC-76 BOARD(CONDUCTOR SIDE)


MIC (PLUG IN) POWER
DC OUT
S650
BUILT-IN MIC
L650
L654
J650
WIND
D652
L652
J651
C676
C675
R664
Q651
R653
Q650
C680
CN650
C655
W651
CN652
C678
D655
21

SW-183 BOARD (COMPONENT SIDE)


D901
S901
START/STOP
R900
D908
Q901
Q900
D905
W900
D902
CN930
CN901
04

SW-183 BOARD (CONDUCTOR SIDE)

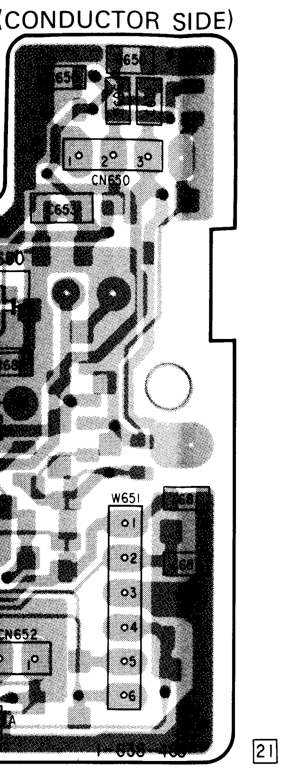

J901
REMOTE
CN931
L903
D900
J900
HEADPHONE
S900
STANDBY
LOCK
D903
D906
1-638-489-
21

< DIODE >

D900	8-719-977-34	DTZ12
D901	8-719-977-34	DTZ12
D902	8-719-404-46	MA110
D903	8-719-977-34	DTZ12
D905	8-719-404-46	MA110
D906	8-719-404-46	MA110
D907	8-719-404-46	MA110
D908	8-719-976-97	DTZ5. 1

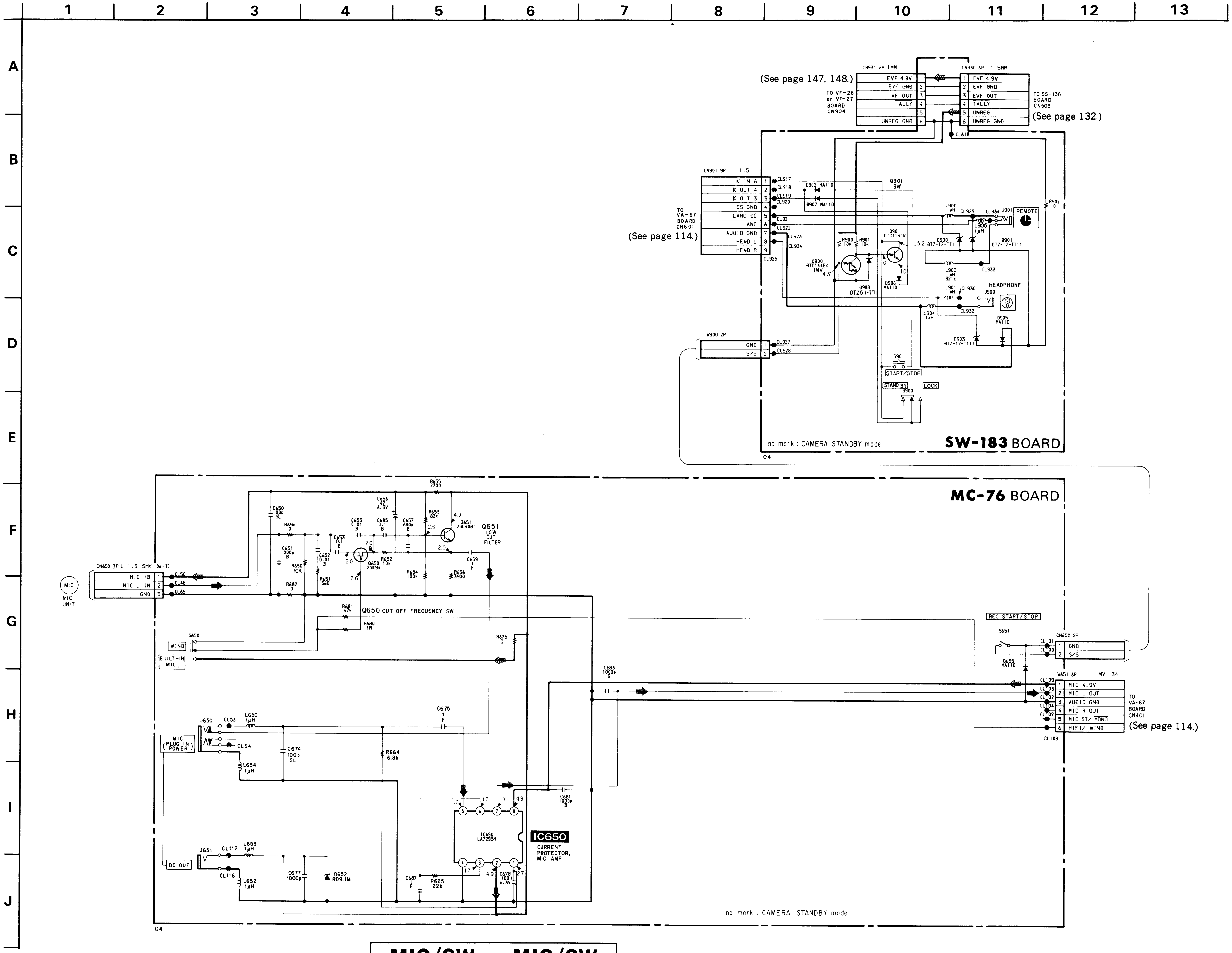
< TRANSISTOR >

Q900	8-729-901-01	DTC144EK
Q901	8-729-902-XX	DTC114TK


(CONDUCTOR SIDE)
CN650
W651
CN652
21

MC-76 (MIC), SW-183 (SWITCH, JACK) SCHEMATIC DIAGRAM

—Ref. No. MC-76 and SW-183 BOARDS : 4000 series—

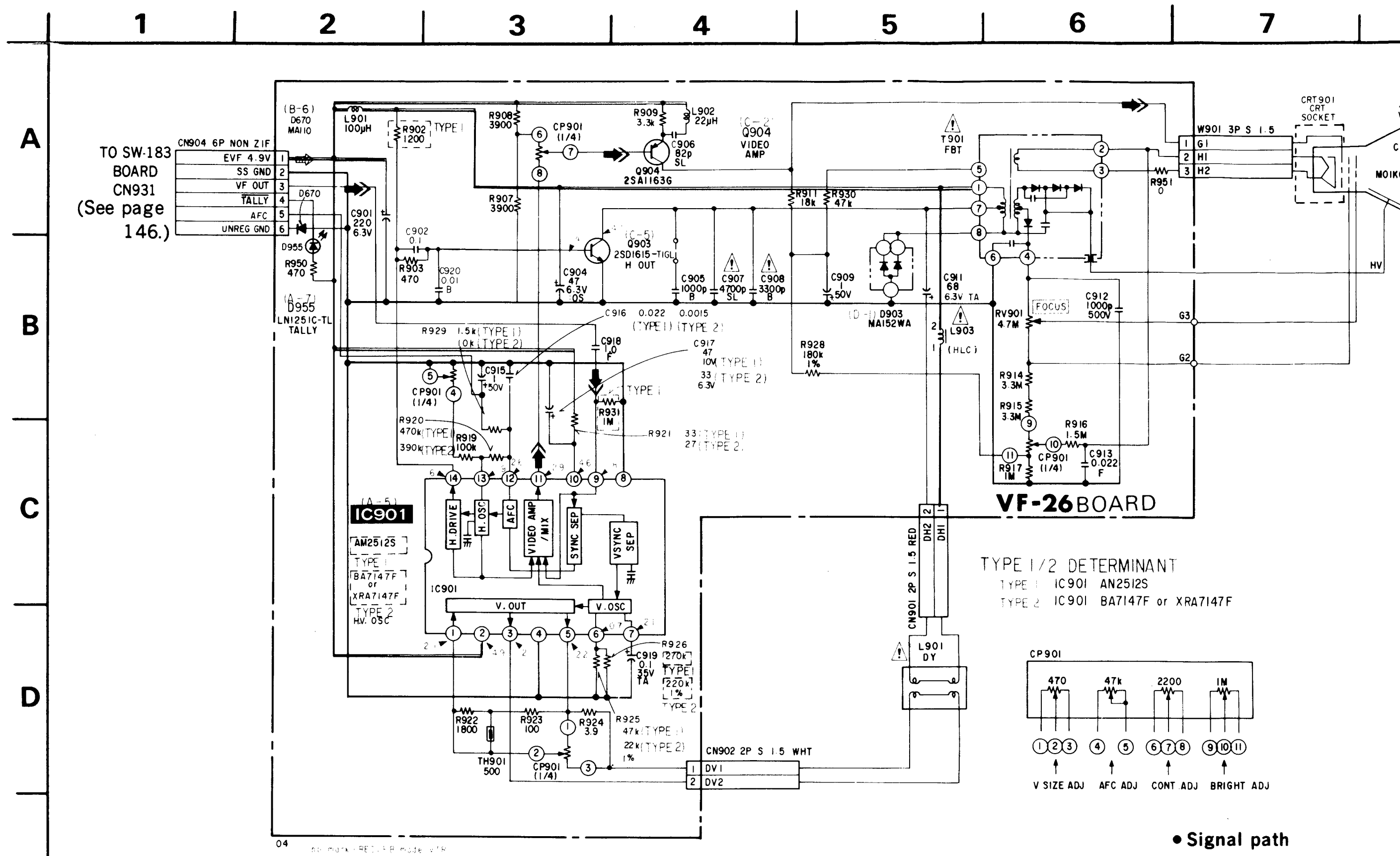

1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
J
CN931 6P 1MM
EVF 4.9V
EVF GND
VF OUT
TALLY
UNREG GND
(See page 147, 148.)
TO VF-26 or VF-27 BOARD CN904
CN930 6P 1.5MM
EVF 4.9V
EVF GND
EVF OUT
TALLY
UNREG
UNREG GND
TO SS-136 BOARD CN503
(See page 132.)
CL618
CN901 9P 1.5
K IN 6
K OUT 4
K OUT 3
SS GND
LANC DC
LANC
AUDIO GND
HEAD L
HEAD R
TO VA-67 BOARD CN601
(See page 114.)
D902 MA110
D907 MA110
Q901 SW
Q900 DTC144EK INV
Q901 DTC114TK
D908 DTZ5.1-TTII
D906 MA110
D900 DTZ-12-TT11
D901 DTZ-12-TT11
D903 DTZ-12-TT11
D905 MA110
REMOTE
J901
HEADPHONE
J900
W900 2P
GND
S/S
S901
START/STOP
STAND BY
S900
LOCK
no mark : CAMERA STANDBY mode
SW-183 BOARD
MC-76 BOARD
CN650 3P L 1.5 SMK (WHT)
MIC +B
MIC L IN
GND
MIC
MIC UNIT
Q651 2SC4081
Q651 LOW CUT FILTER
Q650 2SK94
Q650 CUT OFF FREQUENCY SW
S650
WIND
BUILT-IN MIC
J650
MIC (PLUG IN POWER)
J651
DC OUT
D652 RD9.1M
IC650 LA7295M
IC650
CURRENT PROTECTOR, MIC AMP
REC START/STOP
S651
CN652 2P
GND
S/S
D655 MA110
W651 6P
MV-34
MIC 4.9V
MIC L OUT
AUDIO GND
MIC R OUT
MIC ST/ MONO
HIFI/ WIND
TO VA-67 BOARD CN401
(See page 114.)
no mark : CAMERA STANDBY mode

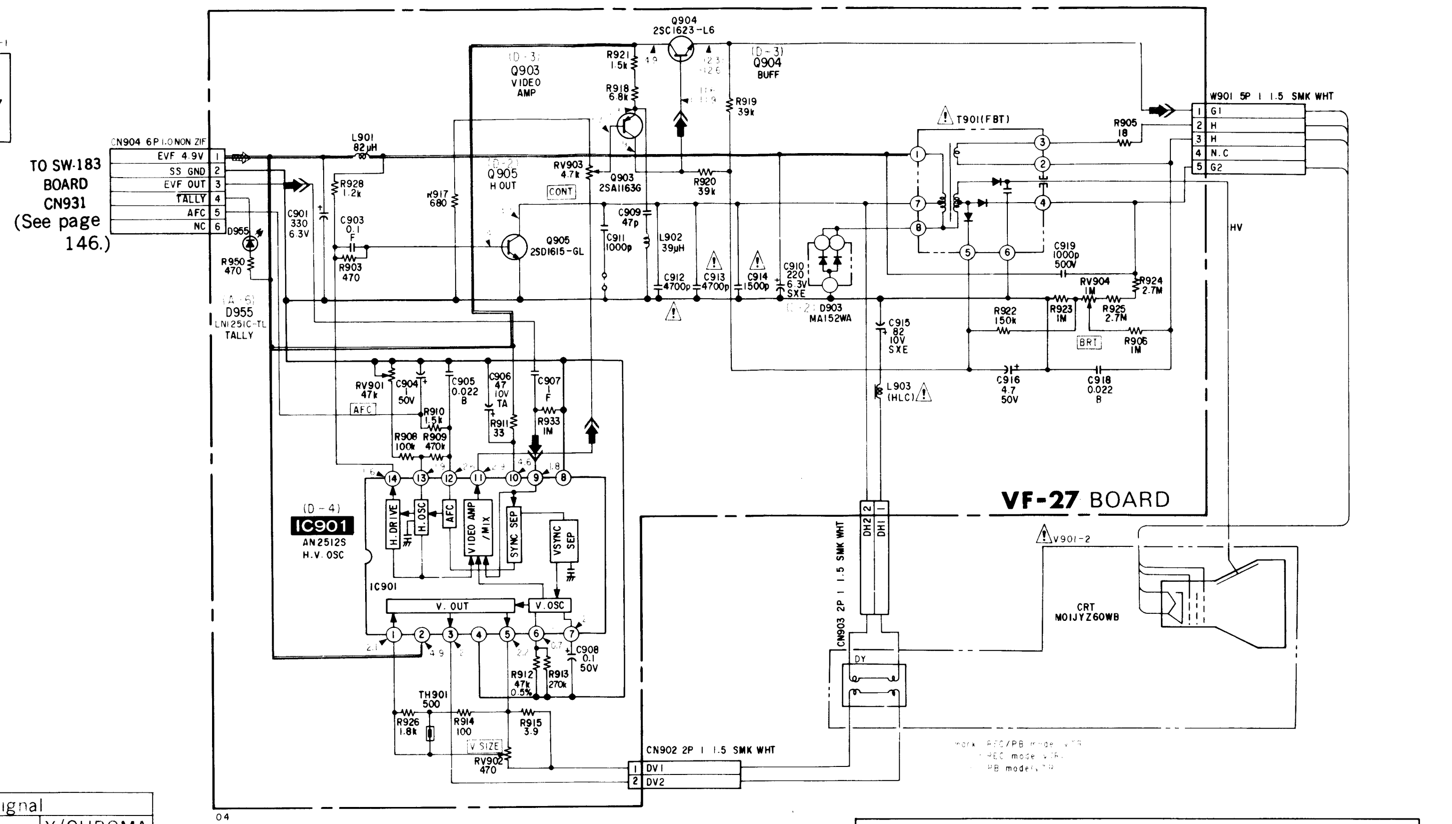
• Signal path

	AUDIO Signal
REC	➡

VF-26, VF-27 (VIEWFINDER) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

—Ref. No. VF-26 BOARD : 6000 series, VF-27 BOARD : 7000 series—


1
2
3
4
5
6
7
8
A
B
C
D
E
TO SW-183 BOARD CN931 (See page 146.)
CN904 6P NON ZIF
EVF 4.9V
SS GND
VF OUT
TALLY
AFC
UNREG GND
D670 MA110
L901 100μH
R902 1200 TYPE 1
R908 3900
R907 3900
CP901 (1/4)
R909 3.3k
L902 22μH
Q904 2SA1163G
Q904 VIDEO AMP
Q903 2SD1615-T(GL) H OUT
C906 82p SL
R911 18k
R930 47k
T901 FBT
W901 3P S 1.5
G1
H1
H2
CRT901 CRT SOCKET
V901-1
CRT M01KG007 WB
R951
HV
D955
R950 470
D955 LN1251C-TL TALLY
C901 220 6.3V
C902 0.1
R903 470
C920 0.01
C904 47 6.3V
C905 1000p
C907 4700p
C908 3300p
C909 50V
C911 68 6.3V TA
D903 MA152WA
L903 (HLC)
RV901 4.7M FOCUS
C912 1000p 500V
G3
G2
R929 1.5k (TYPE 1) 0k (TYPE 2)
C916 0.022 0.0015 (TYPE 1) (TYPE 2)
C918 1.0
C917 47 10V (TYPE 1) 33 (TYPE 2) 6.3V
R928 180k 1%
R914 3.3M
R915 3.3M
R916 1.5M
R917 1M
C913 0.022
CP901 (1/4)
R920 470k (TYPE 1) 390k (TYPE 2)
R919 100k
R931 1M
R921 33 (TYPE 1) 27 (TYPE 2)
IC901
AN2512S TYPE 1
BA7147F or XRA7147F TYPE 2
HV. OSC
H DRIVE
H OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP
V. OUT
V. OSC
VF-26 BOARD
R926 (270k TYPE 1) (220k TYPE 2)
C919 0.1 25V TA
R922 1800
R923 100
R924 3.9
R925 47k (TYPE 1) 22k (TYPE 2) 1%
TH901 500
CP901 (1/4)
CN902 2P S 1.5 WHT
DV1
DV2
CN901 2P S 1.5 RED
DH1
DH2
L901 DY
TYPE 1/2 DETERMINANT
TYPE 1 IC901 AN2512S
TYPE 2 IC901 BA7147F or XRA7147F
CP901
470
47k
2200
1M
V SIZE ADJ
AFC ADJ
CONT ADJ
BRIGHT ADJ
04


9
10
11
12
13
14
15
TO SW-183 BOARD CN931 (See page 146.)
CN904 6P 1.0 NON ZIF
EVF 4.9V
SS GND
EVF OUT
TALLY
AFC
NC
Q904 2SC1623-L6
Q904 BUFF
Q903 VIDEO AMP
R921 1.5k
R918 6.8k
R919 39k
L901 82μH
R928 1.2k
R917 680
Q905 H OUT
RV903 4.7k CONT
Q903 2SA1163G
R920 39k
C909 47p
Q905 2SD1615-GL
C911 1000p
L902 39μH
C912 4700p
C913 4700p
C914 1500p
C910 220 6.3V SXE
D903 MA152WA
T901 (FBT)
R905 1B
W901 5P 1 1.5 SMK WHT
G1
H
H
N.C
G2
HV
C919 1000p 500V
RV904 1M
R924 2.7M
R922 150k
R923 1M
R925 2.7M
BRT
R906 1M
C915 82 10V SXE
L903 (HLC)
C916 4.7 50V
C918 0.022 B
C901 330 6.3V
C903 0.1 F
R903 470
R950 470
D955 LN1251C-TL TALLY
RV901 47k AFC
C904 1 50V
C905 0.022 B
C906 47 10V TA
C907 F
R910 1.5k
R908 100k
R909 470k
R911 33
R933 1M
IC901 AN2512S H.V. OSC
H. DRIVE
H. OSC
AFC
VIDEO AMP /MIX
SYNC SEP
V SEP
V. OUT
V. OSC
C908 0.1 50V
R912 47k 0.5%
R913 270k
TH901 500
R926 1.8k
R914 100
R915 3.9
V SIZE
RV902 470
CN902 2P 1 1.5 SMK WHT
DV1
DV2
CN903 2P 1 1.5 SMK WHT
DH1
DH2
DY
VF-27 BOARD
V901-2
CRT M01JYZ60WB
04

• Signal path

	VIDEO Signal		
	CHROMA	Y	Y/CHROMA
REC	➡	➡»	➡⋙

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

< DIODE >

D670	8-719-404-46	MA110
D903	8-719-400-20	MA152WA
D955	8-719-404-19	LN1251C

< IC >

IC901	8-759-420-01	AN2512S (TYPE 1)
IC901	8-759-511-01	BA7147F (TYPE 2)

< TRANSISTOR >

Q903	8-729-106-68	2SD1615
Q904	8-729-216-31	2SA1163G

< DIODE >

D903	8-719-400-20	MA152WA
D955	8-719-404-19	LN1251C

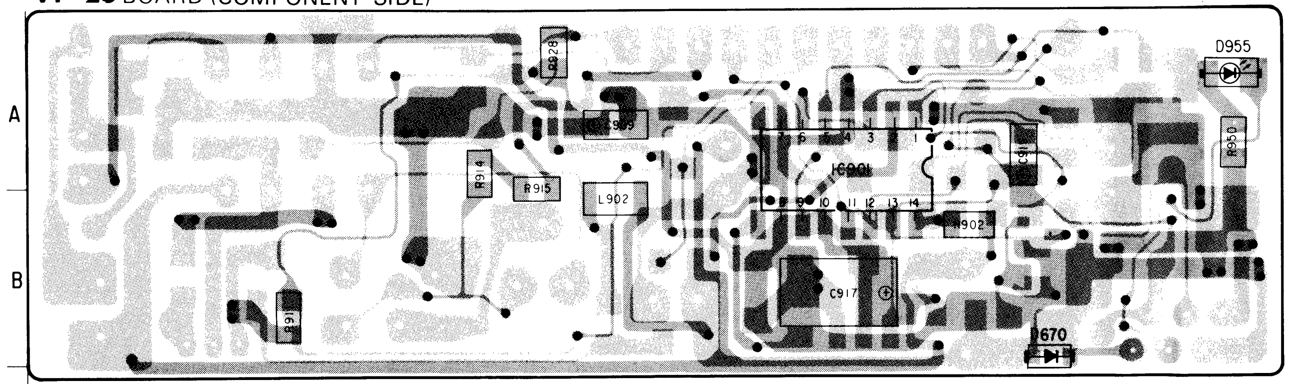
< IC >

IC901	8-759-420-01	AN2512S

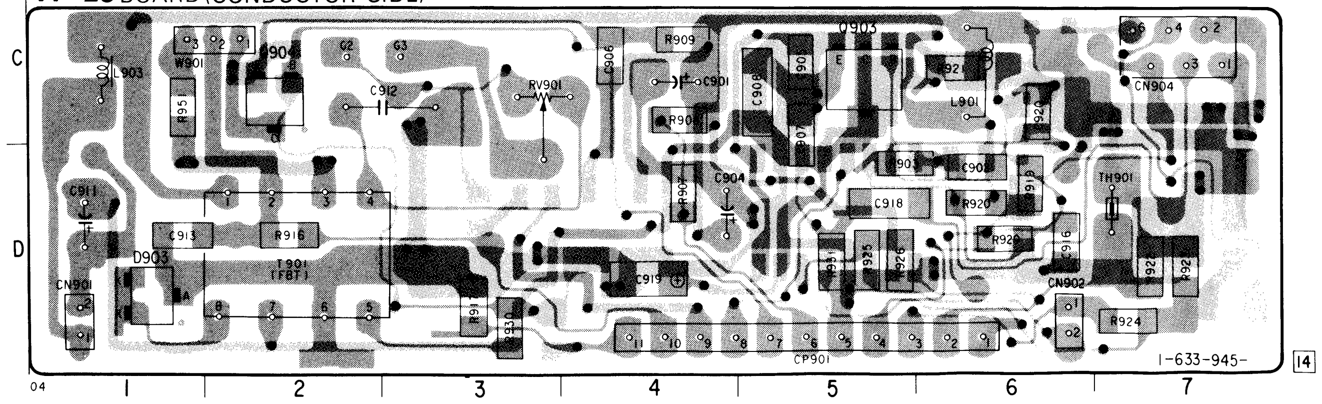
< TRANSISTOR >

Q903	8-729-216-31	2SA1163
Q904	8-729-100-66	2SC1623
Q905	8-729-106-68	2SD1615

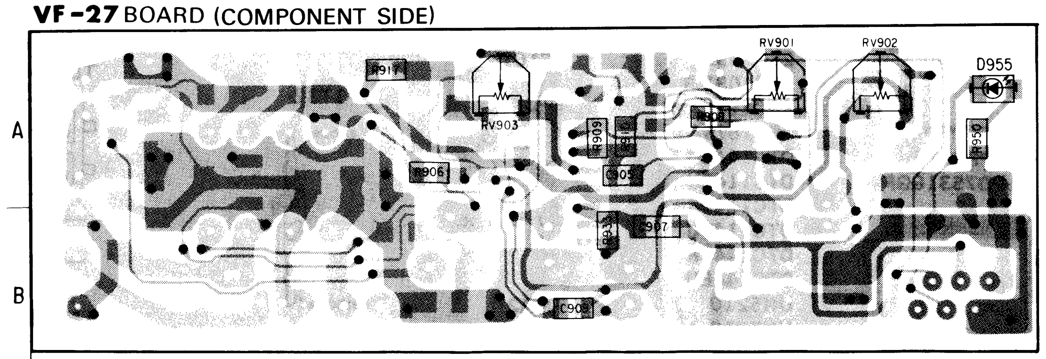
VF-26 BOARD (COMPONENT SIDE)


A
B
D955
R928
R914
R915
L902
IC901
R902
C917
R950
D670

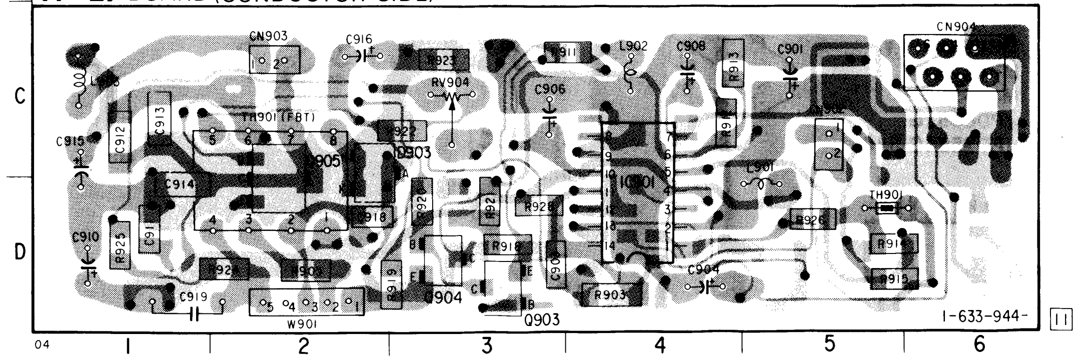
VF-26 BOARD (CONDUCTOR SIDE)


C
D
L903
W901
R951
C904
G2
G3
C912
RV901
R909
C901
Q903
C911
C913
R916
T901 (FBT)
D903
CN901
C904
C918
R920
TH901
CN902
R924
CP901
CN904
1-633-945-
14
04
1
2
3
4
5
6
7

VF-27 BOARD (COMPONENT SIDE)

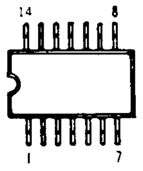

A
B
R917
RV903
RV901
RV902
D955
R906
C905
C907
C903
R950

VF-27 BOARD (CONDUCTOR SIDE)


C
D
CN903
C916
L902
C908
C901
CN904
RV904
C906
TH901 (FBT)
C915
C912
C913
C914
Q905
IC901
L901
TH901
C910
C919
W901
Q904
Q903
R903
C904
R915
1-633-944-
11
04
1
2
3
4
5
6

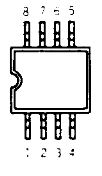
4-3. SEMICONDUCTORS

AN2512S
BA7147F
CXA8010M
LM324D
TL1596CDSB
XRU4011BF
XRU4066BF



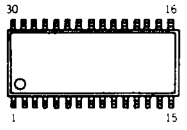
(TOP VIEW)

AK93C46F
BR93CS46F
HA118070FP
LA7293M
LM358D
LM393D
NJM2233AM
NJM2234M
NJM2235M
RC3414M
μPC393G2



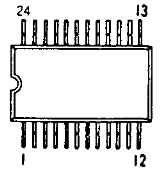
TOP VIEW

CXA1127M
CXA8006M



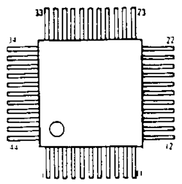
(Top view)

CXA1203N

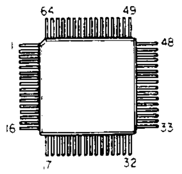


(TOP VIEW)

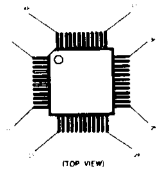
CXA1204Q



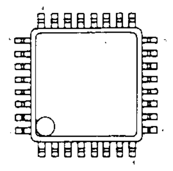
CXA1207R
MC68HC11E9


64
49
1
48
16
33
17
32

CXA1208R
CXA1392R
CXA1488R
MB3783PFV
MB673198U

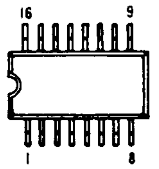


CXA1516Q
CXD1159Q



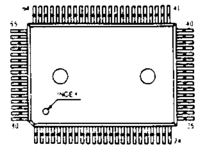
MARKING SIDE VIEW

CXA1448N
CXL1506M
MC14028BF
SN74HC4040NS



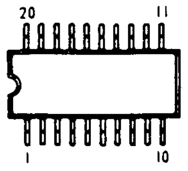
(TOP VIEW)

CXP80116
μPD75316GF



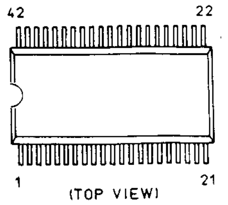
MARKING SIDE VIEW

MB88341PFV
MPC1737M
M62352GP
μPD6451G
μPD7564G-540



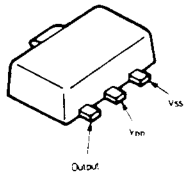
(TOP VIEW)

M34206M2-109FP

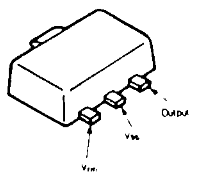


(TOP VIEW)

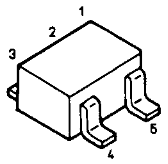
S-8054ALB-LM-S


Vss
Vdd
Output

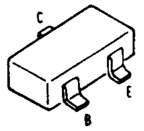
S-81250HG-RD-S


Output
Vss
Vdd

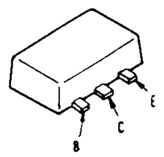
TC4S66F



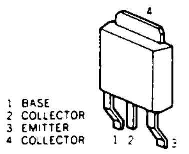
2SA1163
2SA1576-R
2SB624-BV345
2SC1623
2SC2223
2SC3395
2SC4081-R
2SC4176
2SD1819A
DTA144EU
DTC114EU
DTC114TK
DTC114TU
DTC144EK
DTC144EU
UN5210
UN5212
UN5215



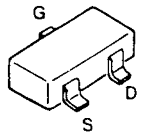
2SB1115A
2SB1121
2SB798-DL
2SD1615



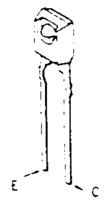
2SB1202FA


4
1 BASE
2 COLLECTOR
3 EMITTER
4 COLLECTOR
1
2
3

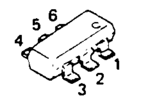
2SK1332-3
2SK300
2SK94



EE-109

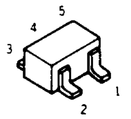


FC101

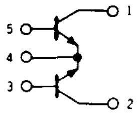


1: 1E, 2: 1B, 3: 2C,
4: 2E, 5: 2B, 6: 1C

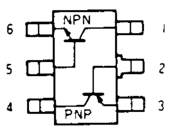
FMA2
FMG2



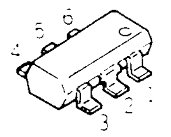
1 Tr1 :Collector 1
2 Tr2 :Collector 2
3 Tr2 :Base 2
4 Tr1, 2 :Emitter
5 Tr1 :Base 1



XN4601

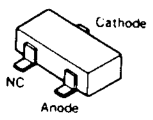

6
NPN
1
5
2
4
PNP
3

XN6213
XN6215
XN6401
XN6501

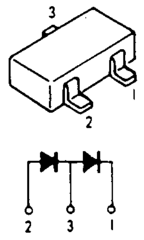


1: 1C, 2: 1B, 3: 2C,
4: 2B, 5: 2E, 6: 1E

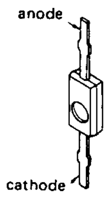
1SS196
SB10-05PCP


Cathode
NC
Anode

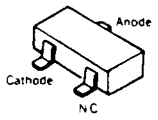
1SS226



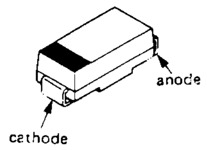
1T32


anode
cathode

DAN202U

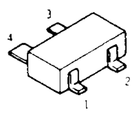

Anode
Cathode
NC

DTZ5.1
DTZ12
MA110
MA728
MA8051-M

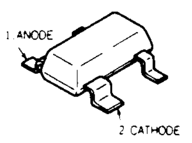

anode
cathode

DWA010
MA151A

1 cathode
2 cathode
3 anode
4 anode



GL1HD51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2 CATHODE

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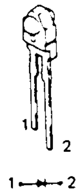

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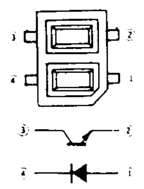

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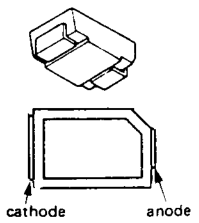
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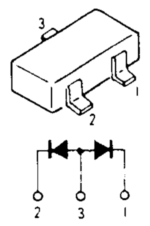

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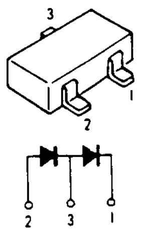

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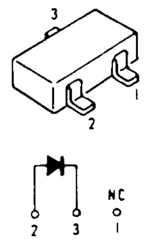

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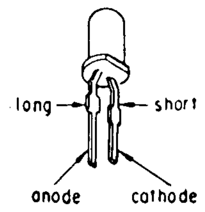
long
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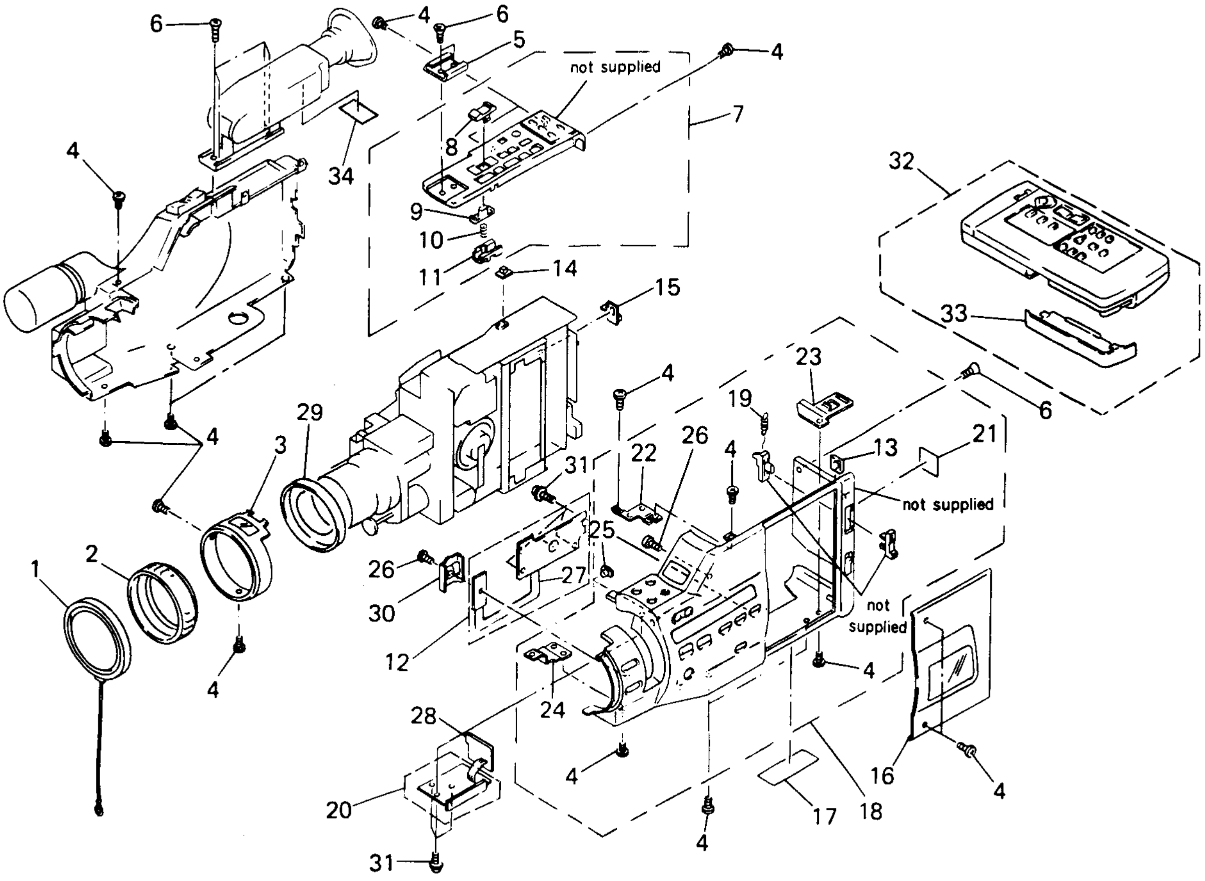
SECTION 5
EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE)...(RED)
  ↑ Parts Color ↑ Cabinet's Color
- Hardware(# mark) list is given in the last of this parts list.

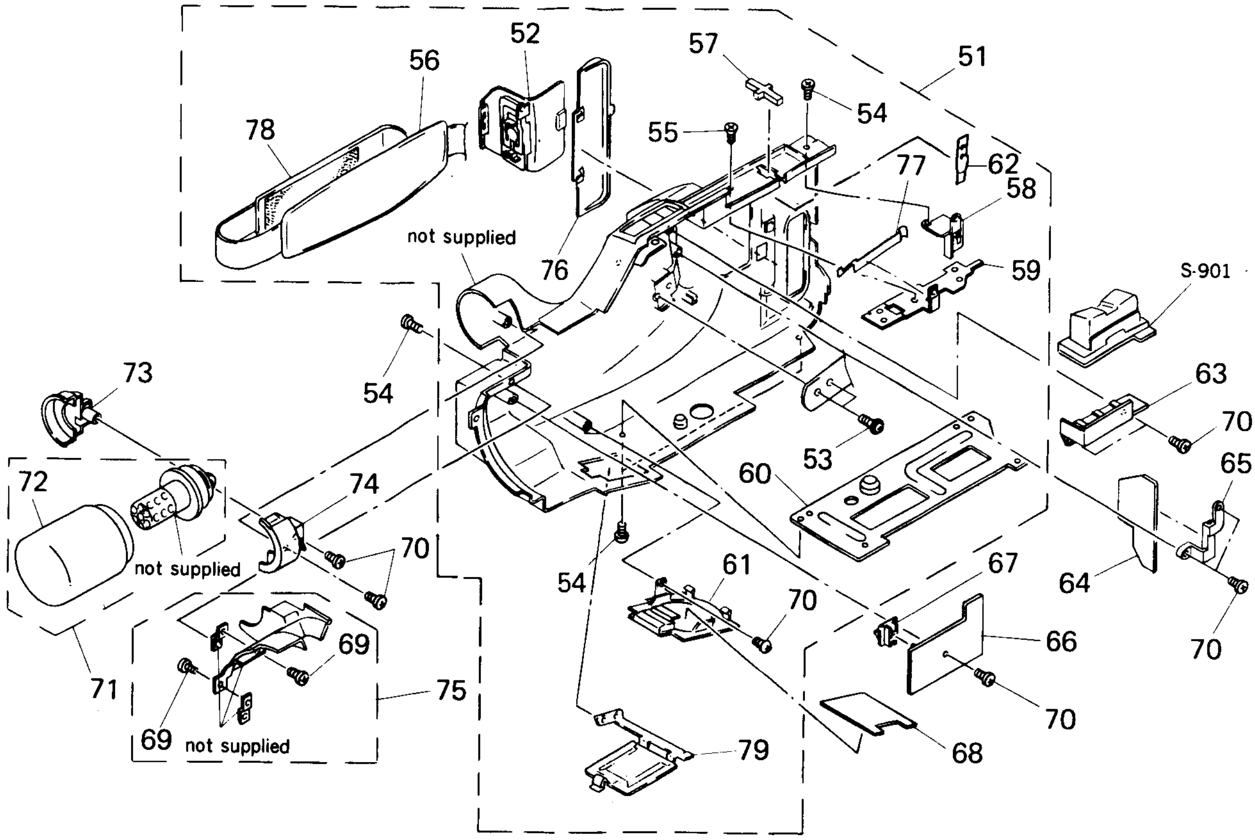
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

5-1. CABINET (R) AND VTR PANEL (L) ASSEMBLIES



Ref. No.	Part No.	Description	Remark
1	A-7090-806-A	CAP ASSY, HOOD	
2	3-728-269-01	HOOD	
3	X-3940-366-1	HOOP ASSY, LENS	
4	3-719-381-01	SCREW (M2X4)	
5	3-724-511-01	SHOE, ACCESSORY	
6	3-719-831-21	SCREW (M2X4)	
7	X-3940-383-1	PANEL (M) ASSY, VTR (AEP/UK)	
	X-3940-857-1	PANEL (M) ASSY, VTR (E)	
8	3-744-723-01	BUTTON (10), POWER	
9	* 3-718-257-11	BUTTON, PUSH, POWER	
10	* 3-303-973-00	SPRING, COMPRESSION	
11	3-744-815-01	PLATE, BLIND, POWER	
12	* A-7071-413-A	CK-ZK BOARD, COMPLETE	
13	3-718-233-01	NUT, PLATE	
14	3-941-708-01	BUTTON (60), EDIT	
15	3-744-875-03	KNOB, REMOTE	
16	X-3940-384-1	LID (M) ASSY, CASSETTE	
17	* 3-941-749-01	LABEL, MODEL NUMBER (AEP)	
	* 3-943-353-01	LABEL, MODEL NUMBER (E/UK)	
18	X-3940-382-1	CABINET (R) ASSY	
19	3-674-402-00	SPRING, TENSION	
20	* A-7062-752-A	DK-ED BOARD, COMPLETE	
21	* 3-719-683-01	LABEL, BATTERY FITTING	
22	3-744-810-01	RETAINER, SHOE	
23	3-744-811-01	SHEET METAL (LOWER), STRAP	
24	3-744-821-01	JOINT, L/R	
25	3-744-847-01	GUIDE	
26	3-713-790-21	SCREW (M2X6), TAPPING, P3	
27	1-633-985-11	FP-298 FLEXIBLE BOARD	
28	* A-7062-751-A	RM-50 BOARD, COMPLETE	
29	3-744-839-01	RING, CHANGE	
30	3-744-812-01	SHEET METAL, ZK	
31	3-669-480-21	+ PTPWH 2	
32	1-465-395-41	COMMANDER, REMOTE (RMT-502) (E)	
32	1-465-395-81	COMMANDER, REMOTE (RMT-502) (AEP/UK)	
33	3-942-755-01	COVER, BATTERY	
34	* 3-704-235-01	LABEL, CAUTION (UK)	

5-2. CABINET (L) ASSEMBLY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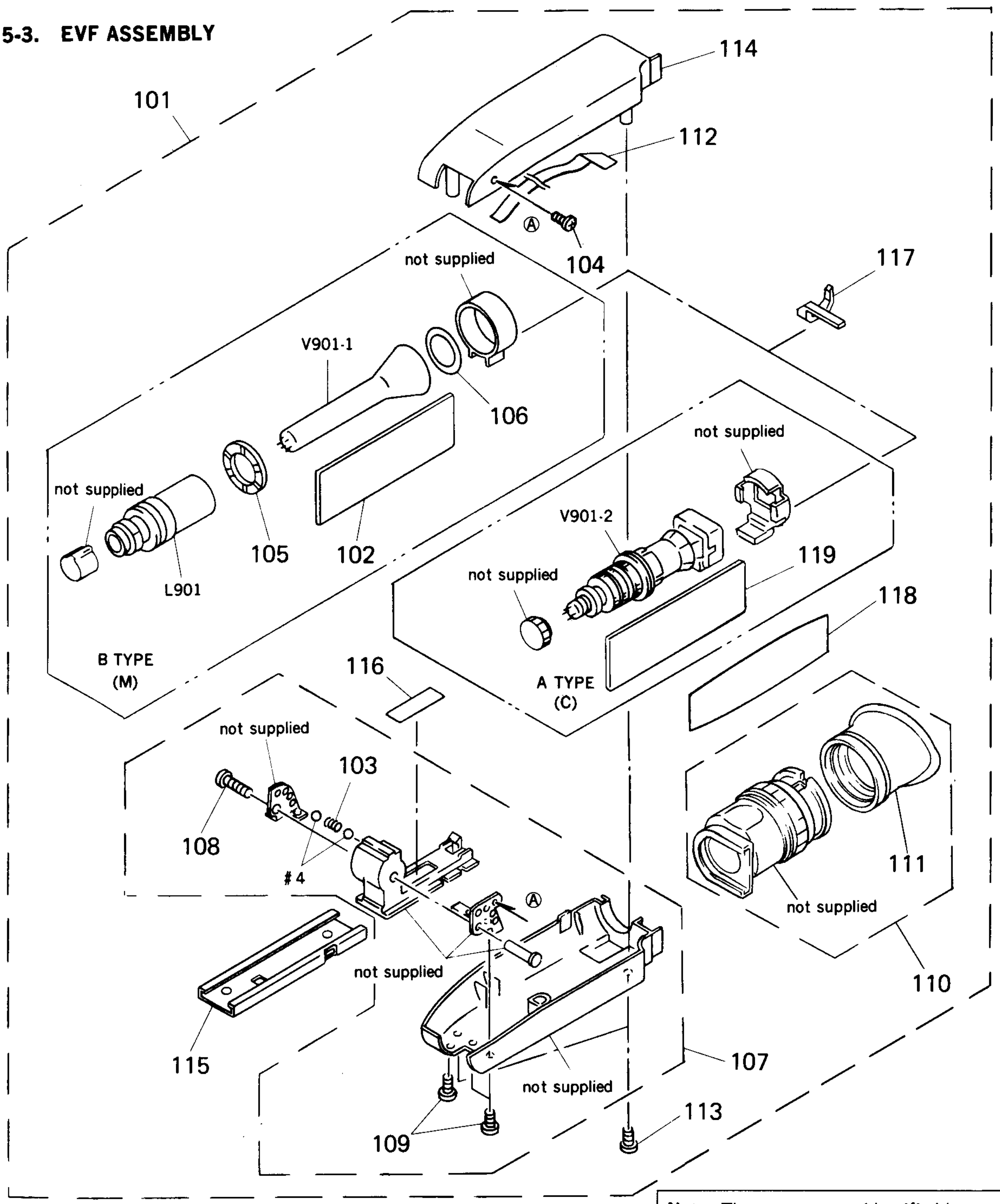
Ref. No.	Part No.	Description	Remark
51	A-7081-530-A	CABINET (L) BLOCK ASSY (AEP/UK)	
	A-7081-546-A	CABINET (L) BLOCK ASSY (E)	
52	X-3744-825-1	KNOB ASSY, SP	
53	3-669-480-21	+ PTPWH 2	
54	3-744-720-11	SCREW (M2X3)	
55	3-719-831-21	SCREW (M2X4)	
56	3-724-591-01	PAD, GRIP	
57	3-744-709-01	LOCK, SLIDE	
58	3-744-804-01	SHEET METAL (UPPER), STRAP	
59	X-3744-828-1	RETAINER ASSY, EVF	
60	X-3940-613-1	METAL ASSY, SHEET, TRIPOD	
61	3-744-841-01	HOLDER, LI PC BOARD	
62	3-744-872-01	SPRING, CN	
63	3-744-805-01	BUTTON (BASE), ZOOM	
64	* A-7071-416-A	SW-183 BOARD, COMPLETE	
65	3-744-808-01	RETAINER, SW	
66	* A-7062-755-A	MC-76 BOARD, COMPLETE	
67	3-744-807-41	BUTTON, MICROPHONE	
68	* A-7071-415-A	LI-39 BOARD, COMPLETE	
69	3-744-720-11	SCREW (M2X3)	
70	3-713-790-21	SCREW (M2X6), TAPPING, P3	
71	1-542-125-21	MICROPHONE (C-2027)	
72	3-707-650-11	SCREEN, WIND	
73	3-744-833-01	HOLDER, MICROPHONE	
74	3-744-834-01	HOUSING, MICROPHONE	
75	X-3744-803-1	COVER ASSY, LENS	
76	3-744-874-21	LID, CONNECTOR	
77	3-744-876-01	SPRING, EVF LOCK	
78	3-719-323-01	BELT, GRIP	
79	3-744-840-01	LID, BATTERY CASE	
S901	1-572-286-11	SWITCH, PUSH	

5-3. EVF ASSEMBLY



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A TYPE
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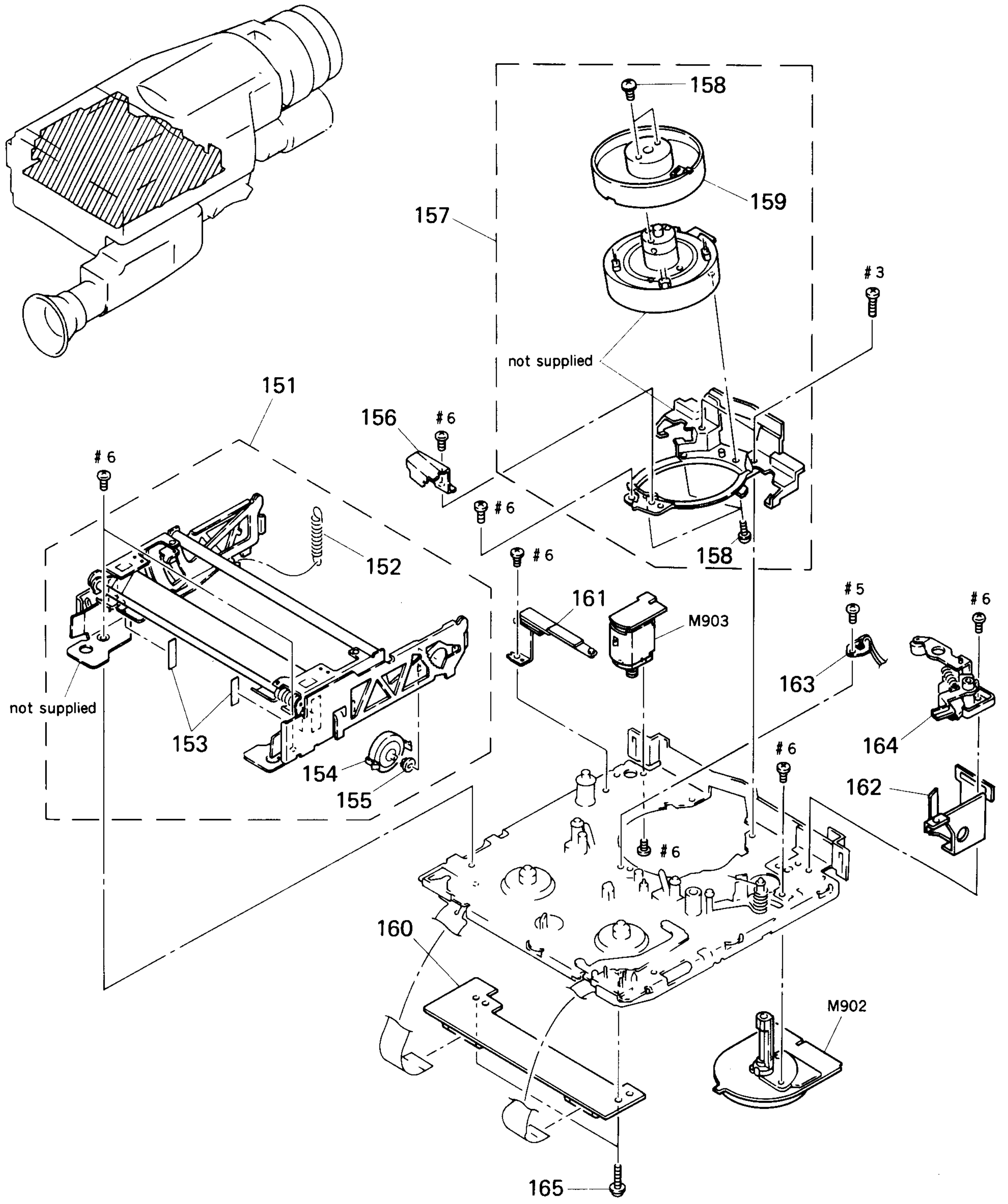
109

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
101	A-7019-301-A	EVF (M) ASSY (B TYPE)	
102	* A-7062-278-A	VF-26 BOARD, COMPLETE (B TYPE)	
103	3-302-492-00	SPRING, COMPRESSION	
104	3-744-720-11	SCREW (M2X3)	
105	3-724-549-01	LOCK, CRT (B TYPE)	
106	3-724-570-01	RING, CRT FIXED (B TYPE)	
107	X-3744-701-1	CASE ASSY, LOWER, VF	
108	3-732-012-11	SCREW (M2X5)	
109	3-744-720-11	SCREW (M2X3)	
110	X-3940-369-1	FINDER (S) ASSY, SPORTS	
111	3-749-142-02	EYE CUP	

Ref. No.	Part No.	Description	Remark
112	1-634-011-11	FP-264 FLEXIBLE BOARD	
113	3-713-790-31	SCREW (M2X8), TAPPING, P3	
114	3-744-705-01	CASE, VF (UPPER)	
115	3-744-712-01	SHOE, VF	
116	3-744-716-01	COVER, FL	
117	3-744-722-01	GUIDE, VF TALLY	
118	3-744-775-01	INSULATOR, VF	
119	* A-7062-279-A	VF-27 BOARD, COMPLETE (A TYPE)	
L901 ⚠	1-451-310-21	DEFLECTION YOKE (B/W) (B TYPE)	
V901-1⚠	1-546-085-11	CATHODE-RAY TUBE, B/W (B TYPE)	
V901-2⚠	1-452-482-11	CRT ASSY (M91JYZ60WB) (A TYPE)	

5-4. MECHANICAL DECK ASSEMBLY (1)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M902
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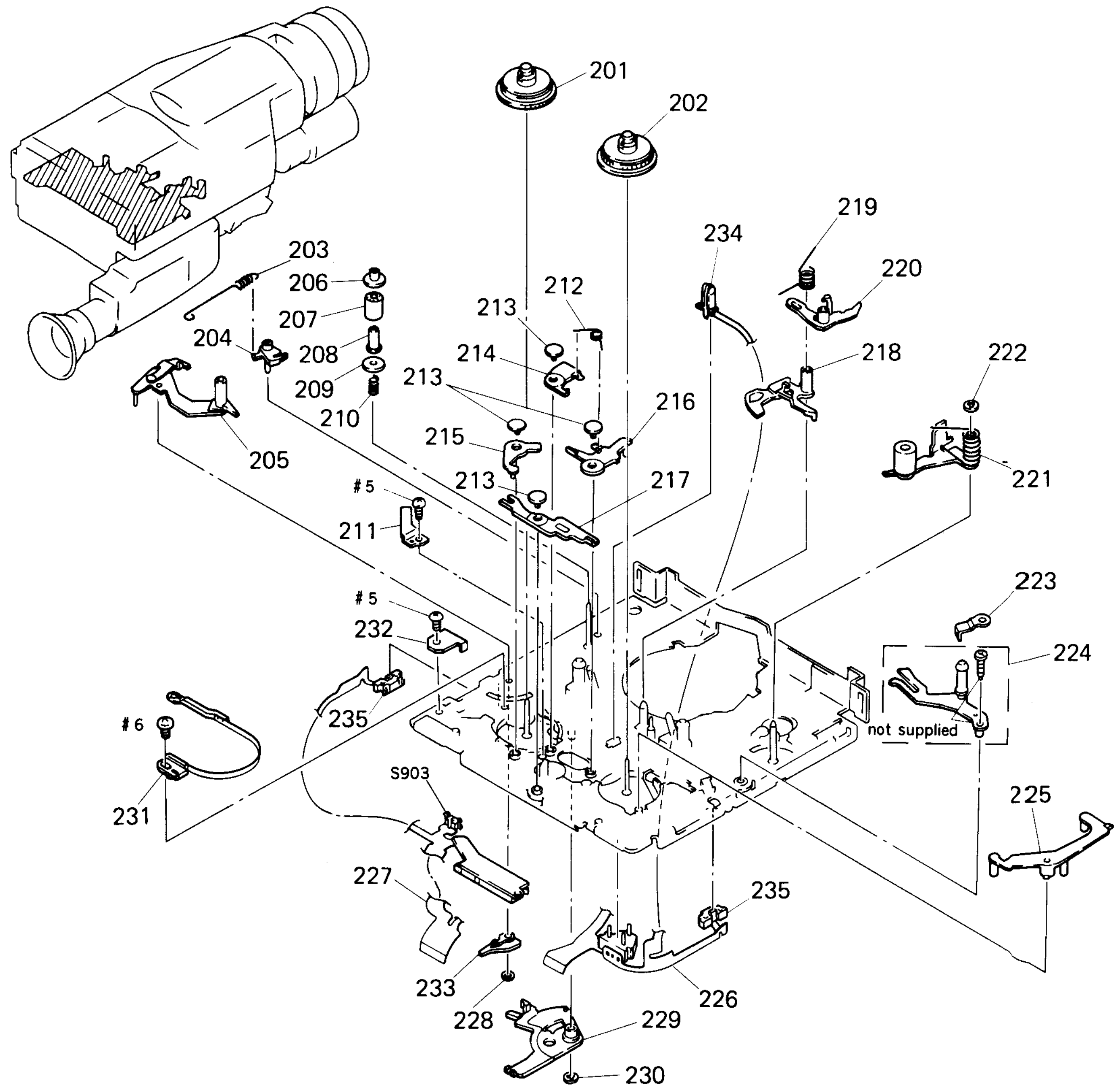
Ref. No.	Part No.	Description	Remark
151	X-3728-874-1	CASSETTE COMPARTMENT ASSY (N)	
152	3-728-825-03	SPRING, TENSION	
153	* 3-728-829-01	TAPE	
154	3-728-867-02	DAMPER, OIL	
155	3-728-829-02	GEAR, DAMPER	
156	3-728-868-01	GUARD, GUIDE	
157	A-7048-405-A	DRUM ASSY (DGU-64A-R)	
158	3-686-493-01	SCREW (M2X5), P1	
159	A-7049-343-A	DRUM ASSY, ROTARY (UPPER) (DGR-64-R)	
160	* A-7071-380-A	CC-61 BOARD, COMPLETE	
161	X-3728-864-1	GROUND ASSY, SHAFT	
162	3-744-114-01	BASE (RP)	
163	1-808-505-12	SENSOR (DEW)	
164	A-7040-205-A	ROLLER BLOCK ASSY (RP), HC	
165	3-713-790-01	SCREW (M2X5), TAPPING, P3	
M902	8-835-331-01	MOTOR, DC U-22A (CAPSTAN)	
M903	A-7040-208-A	MOTOR ASSY, THREADING (LOADING)	

5-5. MECHANICAL DECK ASSEMBLY (2)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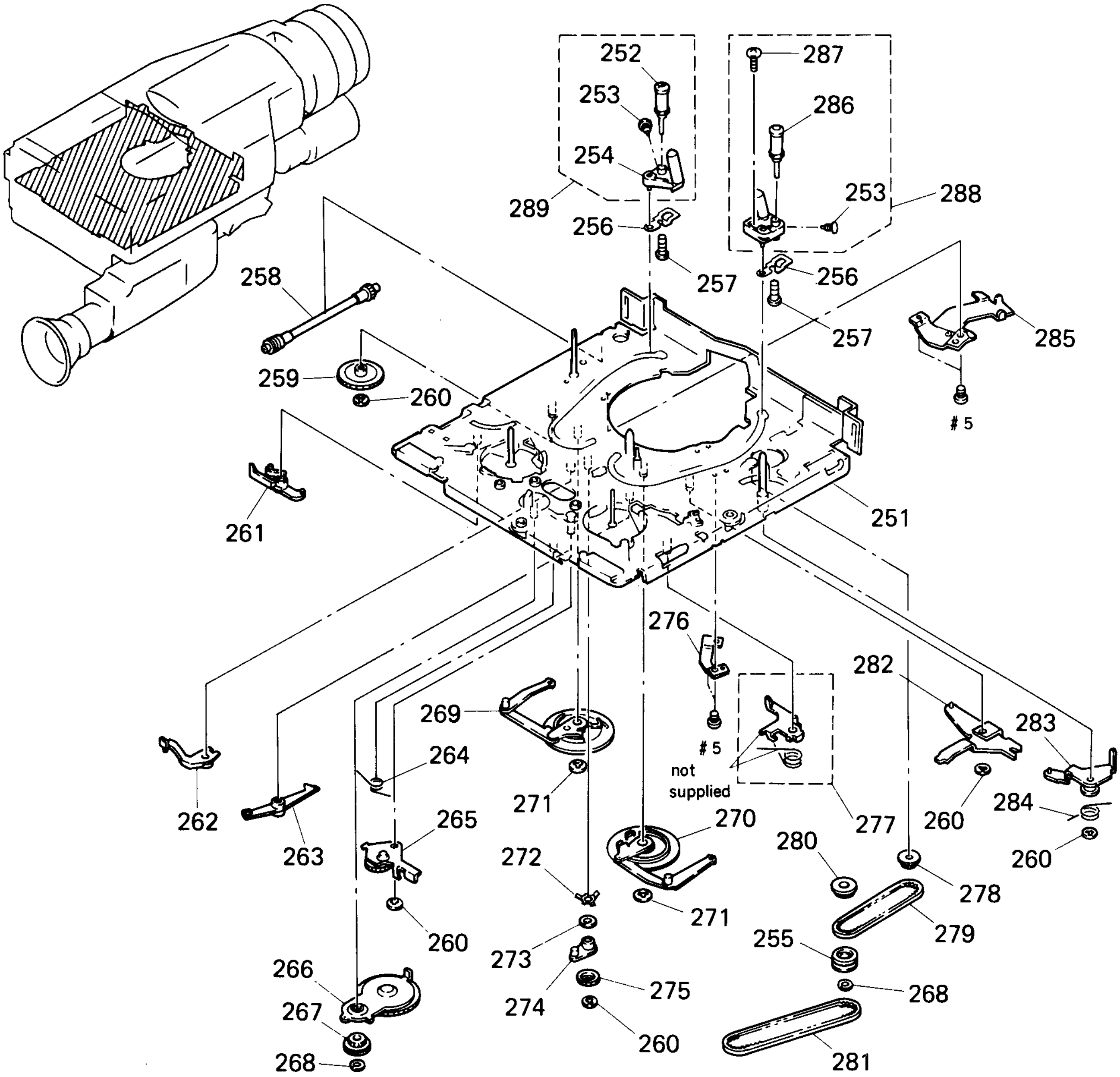
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
201	X-3728-851-1	TABLE ASSY, REEL, S		219	3-726-864-01	SPRING (RK), TORSION	
202	X-3728-855-1	TABLE ASSY, REEL, T		220	3-728-852-02	ARM, RK STOPPER	
203	3-736-414-01	SPRING, TENSION		221	A-7040-219-A	ARM BLOCK ASSY, PINCH	
204	3-728-855-03	ARM, ADJUSTMENT		222	3-669-465-00	WASHER (1.5), STOPPER	
205	X-3728-867-1	ARM ASSY (S), TENSION REGULATOR		223	3-728-808-01	SPRING, LEAF	
206	3-726-884-01	FLANGE, UPPER, TG2		224	X-3728-869-1	ARM ASSY, TG7	
207	3-726-883-01	ROLLER, TG2		225	3-728-848-01	ARM, LB RELEASE	
208	3-726-885-01	SLEEVE, TG2		226	1-628-061-12	FP-90 FLEXIBLE BOARD	
209	3-726-882-02	FLANGE, LOWER, TG2		227	1-628-060-12	FP-89 FLEXIBLE BOARD	
210	3-726-886-01	SPRING, COMPRESSION		228	3-321-393-11	WASHER, STOPPER	
211	3-726-848-01	RETAINER, TL		229	X-3728-863-1	LEVER ASSY, SW	
212	3-726-866-01	SPRING (ST), TORSION		230	3-726-829-01	WASHER, STOPPER	
213	3-726-858-01	PIN, SHAFT RETAINER		231	X-3728-859-1	BAND ASSY, TENSION REGULATOR	
214	3-728-849-01	BRAKE, S		232	3-730-125-01	RETAINER, SW	
215	3-726-852-01	BRAKE, LB		233	X-3728-857-1	STOPPER ASSY, TENSION REGULATO	
216	3-728-850-01	BRAKE, T		234	3-728-837-01	HOLDER, LED	
217	3-726-853-01	LEVER, LB		235	3-728-869-02	HOLDER, SENSOR	
218	3-728-875-01	STOPPER, RK		S903	1-571-099-11	SWITCH	

5-6. MECHANICAL DECK ASSEMBLY (3)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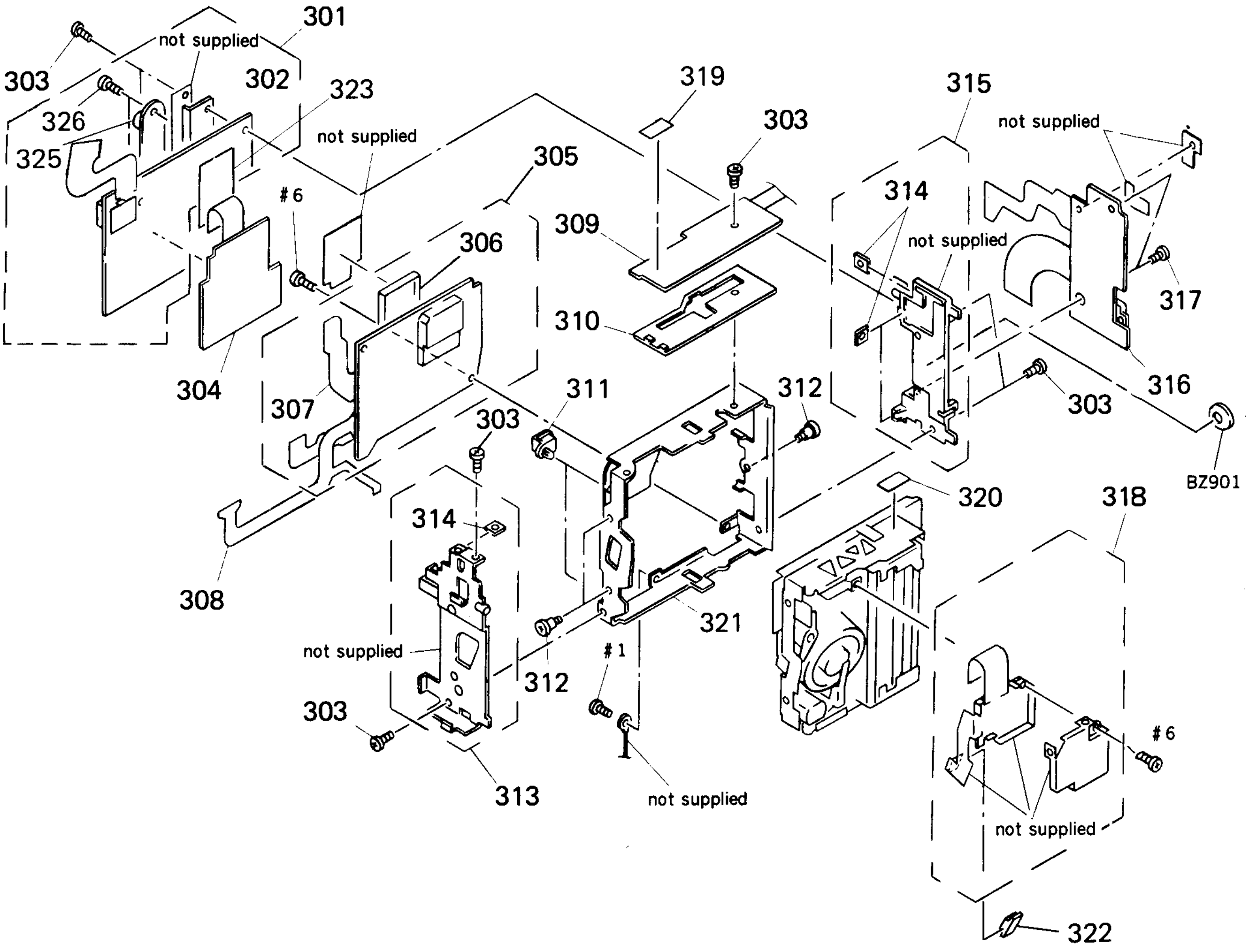
Ref. No.	Part No.	Description	Remark
251	X-3728-862-1	CHASSIS ASSY, MECHANICAL	
252	X-3726-820-1	ROLLER ASSY (U), GUIDE	
253	3-726-822-01	SCREW (M1.4X2) (STEP), HEAD	
254	X-3726-818-1	COASTER (LEFT) ASSY	
255	3-741-196-01	PULLEY (LOWER), BELT MIDWAY	
256	3-736-485-01	SPRING, LEAF, COSTER	
257	3-726-830-01	SCREW (M1.4X4) (THREE LOCK)	
258	X-3728-868-1	WORM ASSY	
259	3-744-109-01	GEAR, WHEEL	
260	3-726-829-01	WASHER, STOPPER	
261	3-728-842-01	LEVER, EJECT	
262	3-728-851-01	BRAKE, UL	
263	3-726-854-01	ARM, BRAKE RELEASE	
264	3-726-865-01	SPRING (LB), TORSION	
265	A-7040-225-A	GEAR BLOCK ASSY (N), LB	
266	X-3728-866-1	GEAR ASSY, RK	
267	X-3728-858-1	GEAR ASSY, RC	
268	3-321-393-11	WASHER, STOPPER	
269	X-3728-842-1	GEAR (LEFT) ASSY, DRIVE	
270	X-3728-843-1	GEAR (RIGHT) ASSY, DRIVE	
271	3-669-465-00	WASHER (1.5), STOPPER	
272	3-726-867-01	SPRING, LEAF	
273	3-701-436-21	WASHER, POLYEHTHYLENE	
274	3-726-857-03	ARM, UL	
275	3-726-856-04	GEAR, UL	
276	* 3-726-805-01	REINFORCEMENT (TT)	
277	X-3726-808-2	BRAKE ASSY, TS	
278	X-3726-805-1	GEAR ASSY, JOINT	
279	3-728-866-11	BELT (S), TIMING	
280	X-3726-813-1	PULLEY (UPPER) ASSY, MIDWAY	
281	3-741-197-01	BELT (L), TIMING	
282	X-3728-846-1	LEVER ASSY, THREADING	
283	X-3726-824-1	ARM ASSY, PINCH SUB	
284	3-726-895-01	SPRING	
285	X-3726-841-1	REINFORCEMENT (SS) ASSY	
286	X-3728-808-4	ROLLER ASSY (U) (PLATING), GUIDE	
287	3-736-473-01	SCREW (M2X0.25) (THREE LOCK)	
288	A-7040-217-A	COASTER (RIGHT) BLOCK ASSY (N1P)	
289	A-7040-128-A	COASTER (LEFT) BLOCK ASSY	

5-7. MAIN BOARD ASSEMBLY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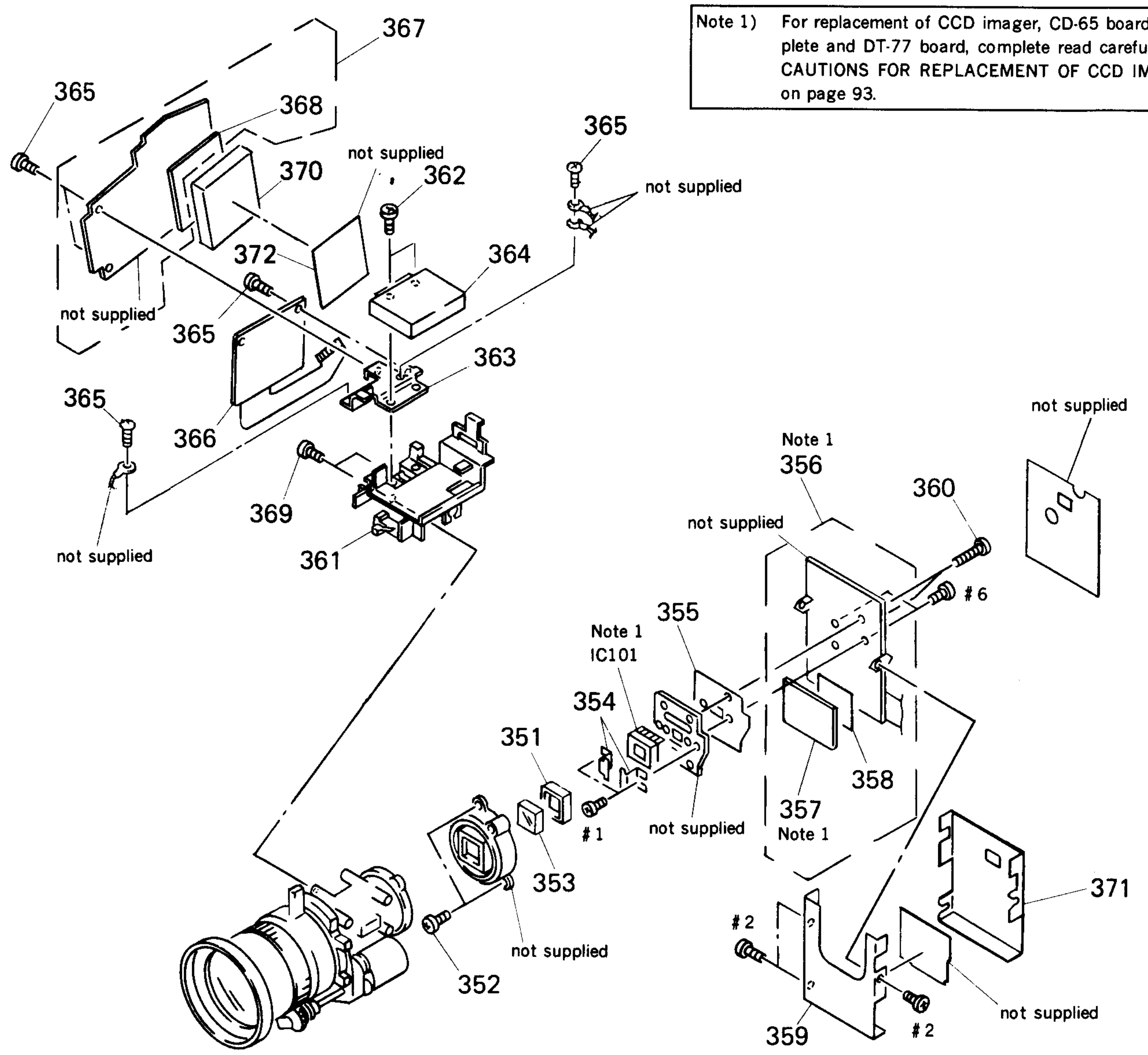
Ref. No.	Part No.	Description	Remark
301	* A-7062-749-A	VA-67 BOARD, COMPLETE (AEP/UK)	
	* A-7062-842-A	VA-67 BOARD, COMPLETE (E)	
302	X-3744-801-1	REINFORCEMENT ASSY, VA	
303	3-744-720-11	SCREW (M2X3)	
304	* A-7062-748-A	CT-38 BOARD, COMPLETE	
305	* A-7062-681-A	SS-136 BOARD, COMPLETE	
306	* X-3744-601-1	CASE ASSY (DD-B), SHIELD	
307	1-633-924-11	FP-248 FLEXIBLE BOARD	
308	1-633-922-11	FP-249 FLEXIBLE BOARD	
309	* A-7071-381-A	VK-14 BOARD, COMPLETE (AEP/UK)	
309	* A-7071-444-A	VK-14 BOARD, COMPLETE (E)	
310	X-3940-614-1	PLATE ASSY, BOTTOM, VTR	
311	3-744-609-01	HINGE (C), PC BOARD	
312	3-744-603-21	SCREW	
313	X-3744-805-1	HOLDER ASSY, MD	
314	3-718-233-01	NUT, PLATE	
315	X-3744-810-1	FRAME (R) ASSY, MD	
316	* A-7062-750-A	FU-100 BOARD, COMPLETE	
317	3-713-790-21	SCREW (M2X6), TAPPING, P3	
318	8-741-509-51	IC SBX1509-51 (HIC RP-77 BOARD, COMPLETE)	
319	* 3-744-948-01	SHEET, ELECTROSTATIC, VK	
320	* 3-730-176-11	SHEET, MD	
321	X-3744-602-1	FRAME ASSY, MD	
322	1-569-347-11	CONNECTOR, FPC (TRANSLATION) 13P	
323	* 3-744-890-01	PLATE, PROTECTION, FLEXIBLE	
325	1-537-142-21	TERMINAL BOARD	
326	3-719-695-01	SCREW (M1.7X3.5), SPECIAL HEAD	
BZ901	1-529-096-12	BUZZER, PIEZOELECTRIC	

5-8. CAMERA BLOCK ASSEMBLY

Note 1) For replacement of CCD imager, CD-65 board, complete and DT-77 board, complete read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 93.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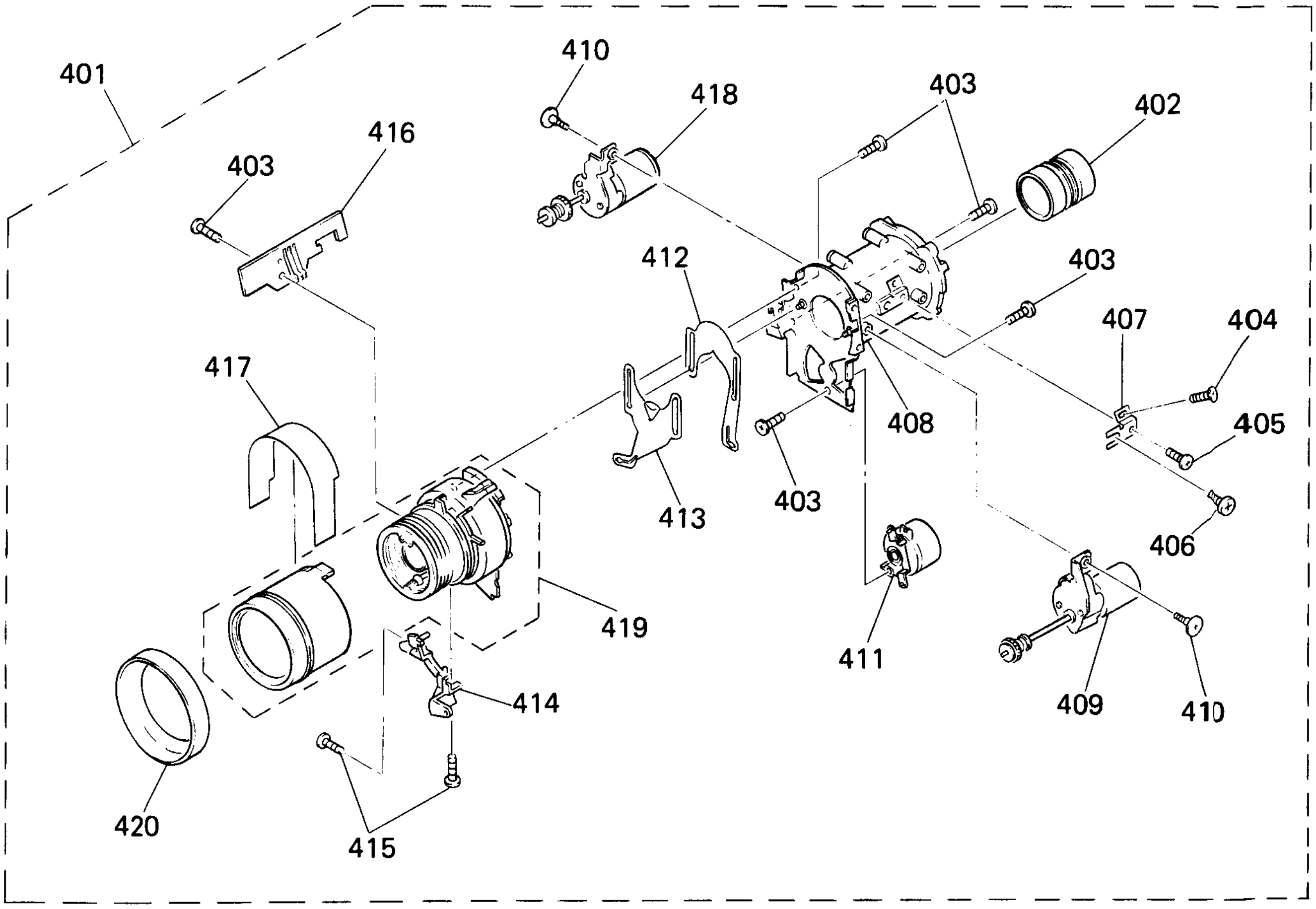
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.		Part No.	Description	Remark
351	*	3-725-177-01	RUBBER, SEAL	
352		3-738-519-11	SCREW (M2X3), +B	
353		1-547-381-12	FILTER BLOCK, OPTICAL	
354	*	3-725-175-01	STOPPER, CCD	
355	*	3-725-180-01	SHEET, INSULATING, CCD HOLDER	
356	*	A-7062-746-A	CD-65 BOARD, COMPLETE (Note 1)	
357		A-7068-173-A	HIC DT-77 BOARD, COMPLETE (HIC121) (Note 1)	
358	*	X-3739-811-1	PLATE ASSY, SHIELD, CD	
359	*	X-3744-702-1	CASE (MAIN) ASSY, SHIELD, C	
360		3-335-640-51	SCREW (M2X16)	
361	*	X-3744-808-1	HOLDER ASSY, LENS	
362		3-713-790-21	SCREW (M2X6), TAPPING, P3	
363	*	3-744-818-01	PLATE, GROUND, CAMERA	
364	⚠	1-466-230-21	CONVERTER UNIT, D/D	
365		3-719-381-01	SCREW (M2X4)	
366	*	A-7062-747-A	AF-86 BOARD, COMPLETE	
367	*	A-7062-745-A	VC-99 BOARD, COMPLETE	
368		A-7068-186-A	HIC MX-10 BOARD, COMPLETE (HIC301)	
369		3-719-408-01	SCREW (B2), TAPPING, P3	
370	*	3-744-763-01	CASE, SHIELD, VC	
371		X-3744-763-1	LID, C SHIELD CASE	
372	*	3-744-892-01	INSULATOR, VC	
IC101		8-752-604-72	IC ICX039AN-2 (CCD IMAGER) (Note 1)	

5-9. ZOOM LENS ASSEMBLY (1)
(VCL-8508XE)


401
410
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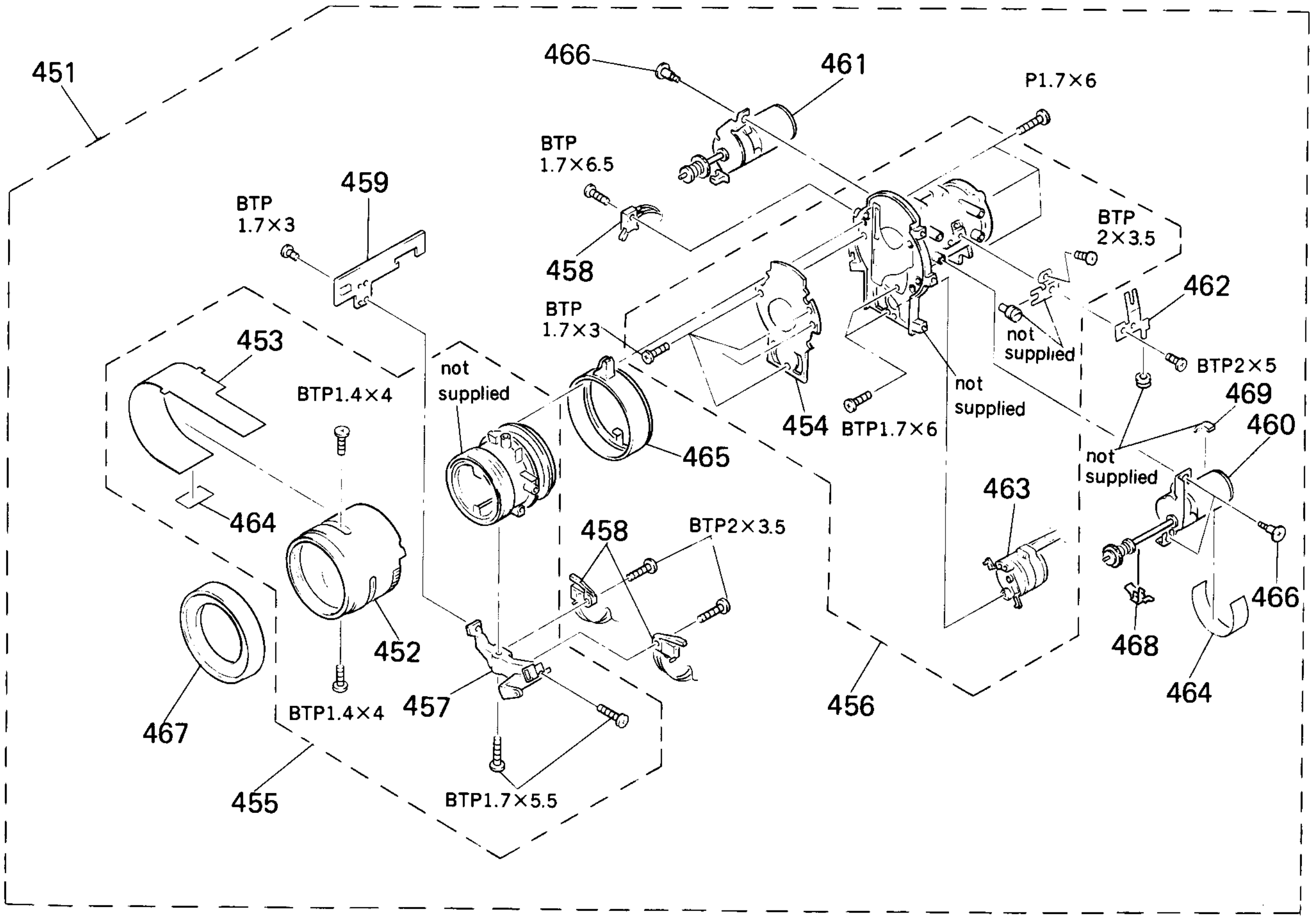
Ref. No.	Part No.	Description	Remark
401	1-547-422-11	LENS, ZOOM (VCL-8508XE)	
402	3-707-945-01	LENS ASSY, MASTER	
403	3-707-946-01	SCREW (M3X4.5)	
404	3-707-947-01	SCREW, MASTER LENS (M4X4)	
405	3-707-948-01	SCREW, TRACKING PLATE (M3.8X2.8)	
406	3-707-949-01	TOP	
407	3-707-950-01	PLATE, FIXED	
408	3-707-951-01	MIRROR TUBE, REAR	
409	3-707-952-01	MOTOR ASSY, AF	
410	3-707-953-01	SCREW, F.Z MOTOR (M6.3X6.1)	
411	3-707-954-01	METER ASSY, IRIS	
412	3-707-955-01	SHUTTLECOCK (A), IRIS	
413	3-707-956-01	SHUTTLECOCK (B), IRIS	
414	3-707-957-01	BRACKET	
415	3-707-958-01	SCREW, BRACKET (M3.5X5)	
416	3-707-959-01	CHASSIS, SENSOR	
417	3-707-961-01	SHEET, F	
418	3-707-962-01	MOTOR ASSY, PZ	
419	3-707-963-01	FZ ASSY	
420	3-744-839-01	RING, CHANGE	

5-10. ZOOM LENS ASSEMBLY (2)
(VCL-8508XF)


451
466
461
P1.7×6
BTP
1.7×6.5
459
BTP
1.7×3
458
BTP
2×3.5
462
BTP
1.7×3
not
supplied
453
BTP1.4×4
not
supplied
BTP2×5
469
460
465
454
BTP1.7×6
not
supplied
463
not
supplied
464
458
BTP2×3.5
466
452
468
464
457
456
467
BTP1.4×4
455
BTP1.7×5.5

Ref. No.	Part No.	Description	Remark
451	1-547-412-15	LENS, ZOOM (VCL-8508XF)	
452	3-707-965-01	RING ASSY (F)	
453	3-707-966-01	SHEET, (F) METER	
454	3-707-967-01	FRAME ASSY, 4 GROUP LENS	
455	3-707-968-01	MIRROR TUBE ASSY	
456	3-707-969-01	MIRROR TUBE ASSY, REAR	
457	3-707-970-01	BLACKET	
458	3-707-971-01	SW ASSY (Z)	
459	3-707-972-01	BOARD ASSY, SENSOR	
460	3-708-059-01	MOTOR ASSY, AF (2)	
461	3-707-974-01	MOTOR ASSY, PZ	
462	3-707-975-01	RETAINER, (F) MOTOR	
463	3-707-976-01	METER ASSY, IRIS	
464	3-707-977-01	TAPE, POLYESTER	
465	3-707-978-01	RING ASSY, ZOOM	
466	3-707-796-01	SCREW, MOTOR SET	
467	3-744-839-01	RING, CHANGE	
468	3-708-087-01	SPRING, (F) SHAFT RETAINER	
469	3-708-058-01	RUBBER	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- CAPACITORS
  uF: μF
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: μH
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD....

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref. No.	Part No.	Description			Remark
	* A-7062-747-A	AF-86 BOARD, COMPLETE			
		*********************			
		(Ref. No 1,000 Series)			
		< CAPACITOR >			
C801	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C802	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C803	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C804	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C805	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C806	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C807	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C808	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C809	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C810	1-164-218-11	CERAMIC CHIP	180PF	0.25PF	50V
C811	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C812	1-164-218-11	CERAMIC CHIP	180PF	0.25PF	50V
C814	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C815	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C816	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C817	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C818	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C820	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C821	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C822	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C823	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C824	1-162-956-11	CERAMIC CHIP	180PF	5%	50V
C825	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C826	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C827	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C828	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C829	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C830	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C831	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C832	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C833	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C834	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C835	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C836	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C837	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C838	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C839	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C840	1-164-634-11	CERAMIC CHIP	1uF		16V
C841	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C842	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C843	1-164-634-11	CERAMIC CHIP	1uF		16V
C844	1-164-634-11	CERAMIC CHIP	1uF		16V
C845	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C846	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C847	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C848	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C849	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C850	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C852	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C853	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C854	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C855	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
		< CONNECTOR >			
CN801	* 1-565-529-21	PIN, CONNECTOR (PC BOARD) 4P			
		< DIODE >			
D801	8-719-404-32	DIODE	MA141WA		
D802	8-719-404-46	DIODE	MA110		
D803	8-719-404-46	DIODE	MA110		
D804	8-719-404-46	DIODE	MA110		

AF-86

< IC >

Ref.No.	Part No.	Description	Remark
IC801	8-759-946-00	IC MB88341PFV	
IC802	8-759-998-98	IC LM358D	
IC803	8-759-100-93	IC uPC393G2	
IC804	8-759-509-29	IC XRU4011BF	
IC805	8-759-509-29	IC XRU4011BF	
IC806	8-759-926-98	IC SN74HC4040NS	
IC807	8-752-055-56	IC CXA1516Q	
IC808	8-759-998-96	IC LM324DR	
IC809	8-759-998-98	IC LM358DR	

< COIL >

Ref.No.	Part No.	Description	Remark
L801	1-412-052-21	INDUCTOR, CHIP 1uH	
L802	1-410-393-11	INDUCTOR, CHIP 100uH	
L803	1-410-656-11	INDUCTOR, CHIP 150uH	
L804	1-410-658-31	INDUCTOR, CHIP 220uH	
L805	1-410-655-31	INDUCTOR, CHIP 120uH	
L806	1-410-387-11	INDUCTOR, CHIP 33uH	

< TRANSISTOR >

Ref.No.	Part No.	Description	Remark
Q801	8-729-402-45	TRANSISTOR UN5212	
Q802	8-729-143-13	TRANSISTOR 2SC4176-B34	
Q803	8-729-905-35	TRANSISTOR 2SC4081-R	
Q804	8-729-905-23	TRANSISTOR 2SA1576-R	
Q805	8-729-143-13	TRANSISTOR 2SC4176-B34	
Q806	8-729-402-78	TRANSISTOR XN6401	
Q807	8-729-905-35	TRANSISTOR 2SC4081-R	
Q808	8-729-905-35	TRANSISTOR 2SC4081-R	
Q809	8-729-905-35	TRANSISTOR 2SC4081-R	
Q810	8-729-905-35	TRANSISTOR 2SC4081-R	
Q811	8-729-905-35	TRANSISTOR 2SC4081-R	
Q812	8-729-420-44	TRANSISTOR UN5210	
Q814	8-729-420-44	TRANSISTOR UN5210	
Q815	8-729-420-44	TRANSISTOR UN5210	

< RESISTOR >

Ref.No.	Part No.	Description	Remark
R801	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R802	1-218-298-11	METAL CHIP 2.2K 0.50% 1/16W	
R803	1-218-313-11	METAL CHIP 560 0.50% 1/16W	
R804	1-216-629-11	METAL CHIP 120 0.5% 1/10W	
R805	1-216-651-11	METAL CHIP 1K 0.5% 1/10W	
R806	1-218-298-11	METAL CHIP 2.2K 0.50% 1/16W	
R807	1-216-820-11	METAL CHIP 820 5% 1/16W	
R808	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R809	1-216-134-00	METAL CHIP 2.2 5% 1/8W	
R810	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R811	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R812	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R813	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R814	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R815	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R816	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R817	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R818	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R819	1-216-853-11	METAL CHIP 470K 5% 1/16W	
R820	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R821	1-216-679-11	METAL CHIP 15K 0.5% 1/10W	
R822	1-216-675-11	METAL CHIP 10K 0.5% 1/10W	
R825	1-216-679-11	METAL CHIP 15K 0.5% 1/10W	
R826	1-216-675-11	METAL CHIP 10K 0.5% 1/10W	
R827	1-216-675-11	METAL CHIP 10K 0.5% 1/10W	
R828	1-216-809-11	METAL CHIP 100 5% 1/16W	
R829	1-216-687-11	METAL CHIP 33K 0.5% 1/10W	
R830	1-216-683-11	METAL CHIP 22K 0.5% 1/10W	
R831	1-216-811-11	METAL CHIP 150 5% 1/16W	
R832	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R833	1-216-817-11	METAL CHIP 470 5% 1/16W	
R834	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R835	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R836	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R837	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R838	1-216-809-11	METAL CHIP 100 5% 1/16W	
R839	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R840	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R841	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R842	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R843	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R844	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R845	1-216-817-11	METAL CHIP 470 5% 1/16W	
R846	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R847	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R848	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R849	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R850	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R851	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R852	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R853	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R854	1-216-817-11	METAL CHIP 470 5% 1/16W	
R855	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R856	1-216-846-11	METAL CHIP 120K 5% 1/16W	
R857	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R858	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R859	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R860	1-216-679-11	METAL CHIP 15K 0.5% 1/10W	
R863	1-216-817-11	METAL CHIP 470 5% 1/16W	
R864	1-216-846-11	METAL CHIP 120K 5% 1/16W	

Ref. No.	Part No.	Description			Remark
R865	1-216-839-11	METAL CHIP	33K	5%	1/16W
R866	1-216-846-11	METAL CHIP	120K	5%	1/16W
R867	1-216-839-11	METAL CHIP	33K	5%	1/16W
R871	1-216-817-11	METAL CHIP	470	5%	1/16W
R872	1-216-821-11	METAL CHIP	1K	5%	1/16W
R873	1-216-834-11	METAL CHIP	12K	5%	1/16W
R874	1-216-834-11	METAL CHIP	12K	5%	1/16W
R875	1-216-834-11	METAL CHIP	12K	5%	1/16W

< FLEXIBLE BOARD >

W801	1-638-477-11	FP-388 FLEXIBLE BOARD

****

* A-7071-380-A CC-61 BOARD, COMPLETE
****
(Ref.No 3,000 Series)

< CONNECTOR >

CN511	1-569-363-21	CONNECTOR, FPC 15P
CN512	1-566-529-11	CONNECTOR, FPC (ZIF) 13P
CN513	1-566-527-11	CONNECTOR, FPC (ZIF) 11P

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* A-7062-746-A CD-65 BOARD, COMPLETE (Note 1)
****
(Ref.No 1,000 Series)

3-744-718-01 HOLDER (10), C

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C101	1-126-200-11	ELECT CHIP	10uF	20%	35V
C102	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C104	1-128-013-11	ELECT CHIP	1uF	20%	50V
C105	1-126-607-11	ELECT CHIP	47uF	20%	4V
C107	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C110	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C111	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C112	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C113	1-128-013-11	ELECT CHIP	1uF	20%	50V
C114	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C115	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C121	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C122	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C123	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C124	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C125	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C126	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C127	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C128	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C129	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C130	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C131	1-162-638-11	CERAMIC CHIP	1uF		16V
C135	1-162-638-11	CERAMIC CHIP	1uF		16V
C136	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C137	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C138	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C140	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C141	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C142	1-135-145-11	TANTALUM CHIP	0.47uF	10%	25V
C144	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C147	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C148	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C187	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C188	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C189	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C190	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C191	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C192	1-126-100-11	ELECT	10uF	20%	6.3V

< CONNECTOR >

CN101	* 1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P

< TRIMMER >

CT121	1-141-424-11	CAP, ADJ
CT122	1-141-356-11	CAP, ADJ

< DIODE >

D101	8-719-404-46	DIODE	MA110
D102	8-719-404-52	DIODE	MA143
D122	8-719-404-32	DIODE	MA141WA
D123	8-719-404-46	DIODE	MA110
D124	8-719-404-32	DIODE	MA141WA
D125	8-719-949-46	DIODE	1T32
D128	8-719-404-46	DIODE	MA110

< HIC >

HIC121	A-7068-173-A	HIC DT-77 BOARD, COMPLETE (Note 1)

< IC >

IC121	8-752-326-08	IC	CXD1159Q

< COIL >

L101	1-412-063-21	INDUCTOR, CHIP 68uH
L121	1-412-058-11	INDUCTOR, CHIP 10uH
L122	1-412-058-11	INDUCTOR, CHIP 10uH
L123	1-410-381-11	INDUCTOR, CHIP 10uH
L182	1-412-058-11	INDUCTOR, CHIP 10uH

Note 1) For replacement of CCD imager, CD-65 board, complete and DT-77 board, complete read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 93.

Ref. No.	Part No.	Description	Remark
L183	1-412-052-21	INDUCTOR, CHIP 1uH	
L184	1-412-058-11	INDUCTOR, CHIP 10uH	
		< TRANSISTOR >	
Q101	8-765-420-02	TRANSISTOR 2SK300-3	
Q102	8-729-905-35	TRANSISTOR 2SC4081-R	
Q121	8-729-402-84	TRANSISTOR XN4601	
Q122	8-729-402-78	TRANSISTOR XN6401	
Q123	8-729-402-19	TRANSISTOR XN6501	
Q125	8-729-905-35	TRANSISTOR 2SC4081-R	
Q126	8-729-402-84	TRANSISTOR XN4601	
Q129	8-729-905-23	TRANSISTOR 2SA1576-R	
Q130	8-729-905-35	TRANSISTOR 2SC4081-R	
Q131	8-729-402-84	TRANSISTOR XN4601	
Q132	8-729-402-84	TRANSISTOR XN4601	
Q133	8-729-402-84	TRANSISTOR XN4601	
Q135	8-729-402-84	TRANSISTOR XN4601	
Q136	8-729-402-45	TRANSISTOR UN5212	
		< RESISTOR >	
R101	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R102	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R103	1-216-820-11	METAL CHIP 820 5% 1/16W	
R104	1-216-809-11	METAL CHIP 100 5% 1/16W	
R105	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R108	1-216-864-11	METAL CHIP 0	
R110	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R111	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R112	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R113	1-216-864-11	METAL CHIP 0	
R114	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R115	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R116	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R117	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R118	1-216-813-11	METAL CHIP 220 5% 1/16W	
R119	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R121	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R122	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R124	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R125	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R126	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R127	1-216-820-11	METAL CHIP 820 5% 1/16W	
R128	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R129	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R130	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R131	1-216-844-11	METAL CHIP 82K 5% 1/16W	
R132	1-216-844-11	METAL CHIP 82K 5% 1/16W	
R133	1-216-850-11	METAL CHIP 270K 5% 1/16W	
R136	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R138	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R139	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R140	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R141	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R142	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R143	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R148	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R149	1-216-864-11	METAL CHIP 0	
R154	1-216-864-11	METAL CHIP 0	
R155	1-216-864-11	METAL CHIP 0	
R156	1-216-809-11	METAL CHIP 100 5% 1/16W	
R157	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R158	1-216-862-11	METAL GLAZE 2.7M 5% 1/16W	
R159	1-216-809-11	METAL CHIP 100 5% 1/16W	
R160	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R161	1-216-809-11	METAL CHIP 100 5% 1/16W	
R162	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R163	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R164	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R165	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R166	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R167	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R168	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R169	1-216-864-11	METAL CHIP 0	
R171	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R173	1-216-813-11	METAL CHIP 220 5% 1/16W	
R181	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R182	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R183	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R184	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R185	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R186	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R187	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R188	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R189	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R190	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R191	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R192	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R193	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R194	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R195	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R196	1-216-813-11	METAL CHIP 220 5% 1/16W	
R197	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R198	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R199	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R200	1-216-844-11	METAL CHIP 82K 5% 1/16W	
R201	1-216-671-11	METAL CHIP 6.8K 0.5% 1/10W	
R202	1-216-643-11	METAL CHIP 470 0.5% 1/10W	
R203	1-216-681-11	METAL CHIP 18K 0.5% 1/10W	

Ref. No.	Part No.	Description			Remark
R204	1-216-671-11	METAL CHIP	6.8K	0.5%	1/10W
R205	1-216-659-11	METAL CHIP	2.2K	0.5%	1/10W
R206	1-216-681-11	METAL CHIP	18K	0.5%	1/10W
R207	1-216-841-11	METAL CHIP	47K	5%	1/16W
R208	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R209	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R210	1-216-833-11	METAL CHIP	10K	5%	1/16W
R215	1-216-842-11	METAL CHIP	56K	5%	1/16W
R216	1-216-833-11	METAL CHIP	10K	5%	1/16W
R217	1-216-833-11	METAL CHIP	10K	5%	1/16W
R220	1-216-835-11	METAL CHIP	15K	5%	1/16W
R221	1-216-840-11	METAL CHIP	39K	5%	1/16W
R222	1-216-833-11	METAL CHIP	10K	5%	1/16W
R226	1-216-864-11	METAL CHIP	0		
R229	1-216-864-11	METAL CHIP	0		
R230	1-216-833-11	METAL CHIP	10K	5%	1/16W
R231	1-216-813-11	METAL CHIP	220	5%	1/16W
R232	1-216-813-11	METAL CHIP	220	5%	1/16W
R233	1-216-841-11	METAL CHIP	47K	5%	1/16W
R234	1-216-841-11	METAL CHIP	47K	5%	1/16W

< FLEXIBLE BOARD >

W102	1-633-975-11	FP-268 FLEXIBLE BOARD

< CRYSTAL >

X121	1-579-076-11	VIBRATOR, CRYSTAL (28.375MHz)
X122	1-567-733-11	VIBRATOR, CRYSTAL (17MHz)

****

* A-7071-413-A CK-ZK BOARD, COMPLETE
****
(Including the CK-50 and ZK-14 boards)

1-633-985-11 FP-298 FLEXIBLE BOARD

CK-50 BOARD (Ref.No 5,000 Series)
****

* 3-744-909-01 HOLDER (CK), LCD

< CAPACITOR >

C670	1-163-038-00	CERAMIC CHIP	0.1uF	25V

< CONNECTOR >

CN670	1-565-874-11	PIN, CONNECTOR (PC BOARD) 2P

< DIODE >

D671	8-719-404-46	DIODE MA110
D672	8-719-404-46	DIODE MA110

< IC >

IC670	8-759-634-72	IC M34206M2-109FP

< DISPLAY PANEL >

ND670	1-809-022-11	DISPLAY PANEL, LIQUID CRYSTAL

< RESISTOR >

R670	1-216-121-00	METAL CHIP	1M	5%	1/10W
R671	1-216-295-00	METAL CHIP	0	5%	1/10W
R672	1-216-097-00	METAL CHIP	100K	5%	1/10W
R675	1-216-296-00	METAL CHIP	0	5%	1/8W

< SWITCH >

S670	1-570-870-11	SWITCH, SLIDE (AUTO LOCK)
S671	1-571-787-11	SWITCH, TACTILE (SHUTTER SPEED)
S672	1-571-787-11	SWITCH, TACTILE (PROGRAM AE)
S673	1-571-787-11	SWITCH, TACTILE (FOCUS)
S674	1-571-787-11	SWITCH, TACTILE (PUSH AUTO)
S675	1-571-787-11	SWITCH, TACTILE (BACK LIGHT)
S676	1-571-787-11	SWITCH, TACTILE (WHT BAL)

< CRYSTAL >

X670	1-567-152-00	VIBRATOR, CERAMIC (4MHz)

ZK-14 BOARD (Ref.No 5,000 Series)
****

< SWITCH >

S680	1-571-684-11	SWITCH, TACTIL (MACRO AF)
S681	1-571-684-11	SWITCH, TACTIL (FADER

****

* A-7062-748-A CT-38 BOARD, COMPLETE
****
(Ref.No 2,000 Series)

< CAPACITOR >

C700	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C701	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C702	1-128-020-11	ELECT CHIP	10uF	0	6.3V
C703	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C704	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C706	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C708	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C709	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C710	1-128-020-11	ELECT CHIP	10uF	0	6.3V

CT-38

Ref. No.	Part No.	Description			Remark
C711	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C717	1-128-015-11	ELECT CHIP	22uF	0	4V
C718	1-128-015-11	ELECT CHIP	22uF	0	4V
C720	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C721	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C723	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C724	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C726	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C727	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C728	1-128-020-11	ELECT CHIP	10uF	0	6. 3V
C729	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C730	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C734	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C735	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C736	1-162-638-11	CERAMIC CHIP	1uF		16V
C737	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C738	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C739	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C740	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C741	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C742	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C743	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C744	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C745	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C746	1-164-227-11	CERAMIC CHIP	0. 022uF	10%	25V
C747	1-164-227-11	CERAMIC CHIP	0. 022uF	10%	25V
C748	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C749	1-135-145-11	TANTALUM CHIP	0. 47uF	10%	25V
C750	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C751	1-135-179-21	TANTAL. CHIP	2. 2uF	20%	16V
C752	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C753	1-162-915-11	CERAMIC CHIP	10PF	0. 5PF	50V
C754	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C755	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C756	1-162-638-11	CERAMIC CHIP	1uF		16V
C757	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C758	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C759	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C760	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C761	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C763	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C769	1-128-049-11	ELECT CHIP	1uF	0	50V
C770	1-126-153-11	ELECT	22uF	20%	6. 3V
C773	1-163-809-11	CERAMIC CHIP	0. 047uF	10%	25V
C774	1-162-965-11	CERAMIC CHIP	0. 0015uF	10%	50V
C799	1-135-178-11	TANTAL. CHIP	1. 5uF	20%	20V
C901	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C902	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C903	1-162-947-11	CERAMIC CHIP	33PF	5%	50V

Ref. No.	Part No.	Description			Remark
C904	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C905	1-162-997-11	CERAMIC CHIP	10PF	0. 5PF	50V
C906	1-163-123-00	CERAMIC CHIP	180PF	5%	50V
C907	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C908	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C909	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C910	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C911	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C930	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C931	1-135-178-11	TANTAL. CHIP	1. 5uF	20%	20V
		< CONNECTOR >			
CN705	1-568-336-11	CONNECTOR, BOARD TO BOARD 20P			
		< TRIMMER >			
CT701	1-141-331-11	CAP, CHIP TRIMMER			
CT702	1-141-331-11	CAP, CHIP TRIMMER			
CT901	1-141-331-11	CAP, CHIP TRIMMER			
CT902	1-141-417-11	CAP, ADJ			
		< DIODE >			
D901	8-719-949-46	DIODE 1T32			
D903	8-719-404-46	DIODE MA110			
D904	8-719-404-46	DIODE MA110			
D905	8-719-404-46	DIODE MA110			
D906	8-719-404-46	DIODE MA110			
		< IC >			
IC701	8-759-998-30	IC CF79028PG			
IC702	8-759-979-96	IC MB8464A-15LLPF			
IC703	8-752-039-49	IC CXA1393AN			
IC704	8-759-634-47	IC M51285BGP			
IC707	8-759-710-29	IC NJM2235M			
IC708	8-759-710-09	IC NJM2233AM			
IC709	8-759-710-09	IC NJM2233AM			
IC713	8-759-234-20	IC TC7S08F			
IC901	8-759-970-80	IC MB673198U			
IC902	8-759-153-41	IC uPD6451AGT-611-E1			
		< COIL >			
L700	1-412-028-11	INDUCTOR, CHIP 4. 7uH			
L701	1-410-384-31	INDUCTOR, CHIP 18uH			
L702	1-412-028-11	INDUCTOR, CHIP 4. 7uH			
L703	1-412-028-11	INDUCTOR, CHIP 4. 7uH			
L704	1-412-032-11	INDUCTOR, CHIP 100uH			
L901	1-412-032-11	INDUCTOR, CHIP 100uH			
L902	1-412-143-11	INDUCTOR 39uH			
L903	1-412-282-41	INDUCTOR 470uH			

Ref. No.	Part No.	Description	Remark
		< TRANSISTOR >	
Q701	8-729-925-91	TRANSISTOR DTC115EU	
Q702	8-729-907-03	TRANSISTOR FMG5	
Q703	8-729-905-18	TRANSISTOR DTC144EU	
Q704	8-729-905-35	TRANSISTOR 2SC4081-R	
Q705	8-729-905-24	TRANSISTOR 2SA1576-S	
Q706	8-729-905-18	TRANSISTOR DTC144EU	
Q707	8-729-905-35	TRANSISTOR 2SC4081-R	
Q708	8-729-905-15	TRANSISTOR DTC144WU	
Q709	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q709	8-729-905-35	TRANSISTOR 2SC4081-R	
Q710	8-729-905-35	TRANSISTOR 2SC4081-R	
Q720	8-729-905-18	TRANSISTOR DTC144EU	
Q726	8-729-905-23	TRANSISTOR 2SA1576-R	
Q727	8-729-905-35	TRANSISTOR 2SC4081-R	
Q728	8-729-905-35	TRANSISTOR 2SC4081-R	
Q729	8-729-905-18	TRANSISTOR DTC144EU	
Q730	8-729-905-12	TRANSISTOR DTA144EU	
Q800	8-729-905-18	TRANSISTOR DTC144EU	
Q801	8-729-905-23	TRANSISTOR 2SA1576-R	
		< RESISTOR >	
R700	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R702	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R704	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R706	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R708	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R711	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R713	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R715	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R716	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R717	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R720	1-216-864-11	METAL CHIP 0	
R722	1-216-817-11	METAL CHIP 470 5% 1/16W	
R723	1-216-295-00	METAL CHIP 0 5% 1/10W	
R724	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R725	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R729	1-216-864-11	METAL CHIP 0	
R731	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R732	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R734	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R735	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R736	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R737	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R739	1-216-295-00	METAL CHIP 0 5% 1/10W	
R741	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R742	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R745	1-216-845-11	METAL CHIP 100K 5% 1/16W	

Ref. No.	Part No.	Description	Remark
R747	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R748	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R749	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R750	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R751	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R753	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R754	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R755	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R757	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R758	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R759	1-216-806-11	METAL GLAZE 56 5% 1/16W	
R760	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R761	1-216-814-11	METAL CHIP 270 5% 1/16W	
R762	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R763	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R764	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R766	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R770	1-216-864-11	METAL CHIP 0	
R772	1-216-864-11	METAL CHIP 0	
R776	1-216-815-11	METAL CHIP 330 5% 1/16W	
R777	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R780	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R781	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R782	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R783	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R784	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R787	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R788	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R789	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R793	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R795	1-216-864-11	METAL CHIP 0	
R796	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R797	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R798	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R901	1-216-864-11	METAL CHIP 0	
R902	1-216-864-11	METAL CHIP 0	
R903	1-216-864-11	METAL CHIP 0	
R904	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R905	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R906	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R907	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R908	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R909	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R911	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R912	1-216-864-11	METAL CHIP 0	
R913	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R914	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R915	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R916	1-216-833-11	METAL CHIP 10K 5% 1/16W	

Ref. No.	Part No.	Description				Remark
R917	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R918	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R919	1-216-864-11	METAL CHIP	0			
R920	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R921	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R923	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R924	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R925	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R926	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R927	1-216-864-11	METAL CHIP	0			
R930	1-216-864-11	METAL CHIP	0			
R932	1-216-864-11	METAL CHIP	0			
R933	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R934	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R959	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R960	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R961	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R962	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R963	1-216-815-11	METAL CHIP	330	5%	1/16W	
R964	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R966	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R967	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R968	1-216-814-11	METAL CHIP	270	5%	1/16W	
R969	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R970	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R976	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R977	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R978	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R979	1-216-864-11	METAL CHIP	0			
R982	1-216-809-11	METAL CHIP	100	5%	1/16W	
R983	1-216-809-11	METAL CHIP	100	5%	1/16W	
R984	1-216-809-11	METAL CHIP	100	5%	1/16W	

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description
RV702	1-238-089-11	RES, ADJ CERMET 4.7K
RV703	1-238-092-11	RES, ADJ CERMET 47K

< THERMISTOR >

Ref. No.	Part No.	Description
TH700	1-800-200-00	THERMISTOR S-3K

< FLEXIBLE BOARD >

Ref. No.	Part No.	Description
W704	1-633-979-11	FP-299 FLEXIBLE BOARD

< CRYSTAL >

Ref. No.	Part No.	Description
X701	1-567-733-11	VIBRATOR, CRYSTAL (17.734475MHz)
X703	1-578-690-11	VIBRATOR, CERAMIC (500KHz)

****

Ref. No.	Part No.	Description	Remark
	* A-7062-752-A	DK-ED BOARD, COMPLETE	

****

(Including the DK-15 and ED-32 boards)

DK-15 BOARD (Ref.No 5,000 Series)

****

< CAPACITOR >

Ref. No.	Part No.	Description			
C950	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C951	1-163-003-11	CERAMIC CHIP	330PF	10%	50V
C952	1-163-005-11	CERAMIC CHIP	470PF	10%	50V

< CONNECTOR >

Ref. No.	Part No.	Description
CN950	1-569-478-21	CONNECTOR, FPC 20P

< IC >

Ref. No.	Part No.	Description
IC950	8-759-145-63	IC uPD7564G-540

< TRANSISTOR >

Ref. No.	Part No.	Description
Q950	8-729-901-01	TRANSISTOR DTC144EK

< RESISTOR >

Ref. No.	Part No.	Description			
R950	1-216-073-00	METAL CHIP	10K	5%	1/10W
R951	1-216-073-00	METAL CHIP	10K	5%	1/10W
R952	1-216-073-00	METAL CHIP	10K	5%	1/10W
R953	1-216-089-00	METAL CHIP	47K	5%	1/10W
R954	1-216-029-00	METAL CHIP	150	5%	1/10W
R955	1-216-025-00	METAL CHIP	100	5%	1/10W
R961	1-216-049-00	METAL CHIP	1K	5%	1/10W

< SWITCH >

Ref. No.	Part No.	Description
S950	1-571-684-11	SWITCH, TACTIL (TITLE)
S951	1-571-684-11	SWITCH, TACTIL (AUTO)
S952	1-571-684-11	SWITCH, TACTIL (COLOR/MODE)
S953	1-571-684-11	SWITCH, TACTIL (MEMORY)

< FLEXIBLE BOARD >

Ref. No.	Part No.	Description
W951	1-633-984-11	FP-297 FLEXIBLE BOARD

< CRYSTAL >

Ref. No.	Part No.	Description
X950	1-577-163-21	VIBLATOR, CERAMIC (700KHz)

ED-32 BOARD (Ref.No 5,000 Series)

****

< DIODE >

Ref. No.	Part No.	Description
D920	8-719-941-34	DIODE GL1HD51

Ref. No.	Part No.	Description	Remark
		< SWITCH >	
S920	1-571-684-11	SWITCH, TACTIL (EDIT SERCH -)	
S921	1-571-684-11	SWITCH, TACTIL (EDIT SERCH +)	
		< CONNECTOR >	
W922	1-566-095-11	PIN, BOARD TO BOARD 6P	

****

1-628-060-12 FP-89 FLEXIBLE BOARD
****
(Ref.No 8,000 Series)

Ref. No.	Part No.	Description	Remark
		< DIODE >	
D301	8-719-820-44	PHOTO COUPLER TLP-907-0	
		< TRANSISTOR >	
Q301	8-729-906-48	PHOTO SENSOR EE-TP109	
		< SWITCH >	
S301	1-572-173-11	SWITCH, SLIDE (ENCODER)	

****

1-628-061-12 FP-90 FLEXIBLE BOARD
****
(Ref.No 8,000 Series)

Ref. No.	Part No.	Description	Remark
		< DIODE >	
D302	8-719-940-81	DIODE GL452S	
D303	8-719-820-44	PHOTO COUPLER TLP-907-0	
		< TRANSISTOR >	
Q302	8-729-906-48	PHOTO SENSOR EE-TP109	
		< SWITCH >	
S302	1-572-298-11	SWITCH, PUSH (REC PROOF/TAPE SELECT)	

****

* A-7062-750-A FU-100 BOARD, COMPLETE
****
(Ref.No 5,000 Series)

1-537-281-21 TERMINAL BOARD (EASY CONNECTOR)

Ref. No.	Part No.	Description			Remark
		< CAPACITOR >			
C503	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C504	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C505	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C506	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C507	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C514	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C515	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C516	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C517	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C518	1-135-155-21	TANTALUM CHIP	4.7uF	10%	10V
C519	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C994	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C995	1-128-292-11	ELECT	220uF	20%	10V
C996	1-162-974-11	CERAMIC CHIP	0.01uF		50V
		< CONNECTOR >			
CN502	1-569-480-11	CONNECTOR, FPC 23P			
CN992	1-565-528-11	PIN, CONNECTOR (PC BOARD) 3P			
		< TRIMMER >			
CT501	1-141-331-11	CAP, CHIP TRIMMER			
		< DIODE >			
D501	8-719-421-27	DIODE MA728			
D503	8-719-404-46	DIODE MA110			
D504	8-719-404-46	DIODE MA110			
D505	8-719-404-46	DIODE MA110			
D510	8-719-812-41	LED TLR124, RED			
D511	8-719-404-46	DIODE MA110			
		< IC >			
IC501	8-759-154-18	IC uPD75316GF-116-3B9			
IC502	8-759-511-22	IC CXA1448N-E2			
IC503	8-759-937-54	IC S-81250HG-RD-S			
		< COIL >			
L501	1-412-032-11	INDUCTOR, CHIP	100uH		
L990	1-412-026-11	INDUCTOR CHIP	1uH		
L991	1-410-337-11	INDUCTOR	1uH		
L992	1-410-337-11	INDUCTOR	1uH		
L996	1-412-026-11	INDUCTOR CHIP	1uH		
L997	1-412-026-11	INDUCTOR CHIP	1uH		
		< IC LINK >			
PS990 ⚠·	1-532-841-21	LINK, IC (PRF1600 1.6A)			
PS991 ⚠·	1-532-840-21	LINK, IC (PRF1250 1.25A)			
PS992 ⚠·	1-532-840-21	LINK, IC (PRF1250 1.25A)			

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q509	8-729-904-20	TRANSISTOR FMA2	
Q579	8-729-905-12	TRANSISTOR DTA144EU	
Q990	8-729-101-07	TRANSISTOR 2SB798-DK	
Q991	8-729-905-35	TRANSISTOR 2SC4081-R	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R501	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R505	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R511	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R512	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R513	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R514	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R515	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R516	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R517	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R518	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R520	1-216-864-11	METAL CHIP 0	
R521	1-216-809-11	METAL CHIP 100 5% 1/16W	
R522	1-216-809-11	METAL CHIP 100 5% 1/16W	
R523	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R524	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R525	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R527	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R528	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R529	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R530	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R531	1-216-809-11	METAL CHIP 100 5% 1/16W	
R532	1-216-809-11	METAL CHIP 100 5% 1/16W	
R533	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R534	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R535	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R536	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R537	1-216-817-11	METAL CHIP 470 5% 1/16W	
R538	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R542	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R543	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R544	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R545	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R546	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R547	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R548	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R549	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R550	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R551	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R552	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R553	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R557	1-216-861-11	METAL CHIP 2.2M 5% 1/16W	
R558	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R559	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R563	1-216-864-11	METAL CHIP 0	
R564	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R571	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R572	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R573	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R575	1-216-864-11	METAL CHIP 0	
R576	1-216-864-11	METAL CHIP 0	
R577	1-216-864-11	METAL CHIP 0	
R578	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R579	1-216-864-11	METAL CHIP 0	
R590	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R990	1-216-138-00	METAL CHIP 3.3 5% 1/8W	
R991	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R992	1-216-820-11	METAL CHIP 820 5% 1/16W	
R993	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R994	1-216-807-11	METAL CHIP 68 5% 1/16W	

< SWITCH >

Ref. No.	Part No.	Description	Remark
S501	1-571-275-31	SWITCH, SLIDE (REMOTE COMMANDER ON/OFF)	
S502	1-572-284-11	SWITCH, SLIDE (EJECT)	

< FLEXIBLE BOARD >

Ref. No.	Part No.	Description	Remark
W501	1-633-978-11	FP-295 FLEXIBLE BOARD	
W502	1-633-977-11	FP-293 FLEXIBLE BOARD	
W901	1-633-982-11	FP-294 FLEXIBLE BOARD	

< CRYSTAL >

Ref. No.	Part No.	Description	Remark
X501	1-577-101-11	VIBRATOR, CERAMIC (4.19MHz)	
X502	1-527-997-21	VIBRATOR, CRYSTAL (32.8KHz)	

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* A-7071-415-A LI-39 BOARD, COMPLETE

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(Ref.No 5,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description	Remark
C970	1-163-035-00	CERAMIC CHIP 0.047uF 50V	
C971	1-163-035-00	CERAMIC CHIP 0.047uF 50V	

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN961	1-565-874-11	PIN, CONNECTOR (PC BOARD) 2P	

< JACK >

Ref. No.	Part No.	Description	Remark
J902	1-550-104-11	HOLDER, BATTERY (LITHIUM)	

****

Ref. No.	Part No.	Description
	* A-7062-755-A	MC-76 BOARD, COMPLETE

****

(Ref.No 4,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description
C650	1-162-953-11	CERAMIC CHIP 100PF 5% 50V
C651	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V
C652	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V
C653	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V
C655	1-164-232-11	CERAMIC CHIP 0.01uF 50V
C656	1-126-154-11	ELECT 47uF 20% 6.3V
C657	1-162-963-11	CERAMIC CHIP 680PF 10% 50V
C659	1-162-638-11	CERAMIC CHIP 1uF 16V
C674	1-162-953-11	CERAMIC CHIP 100PF 5% 50V
C675	1-162-638-11	CERAMIC CHIP 1uF 16V
C677	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V
C678	1-126-155-11	ELECT 100uF 20% 6.3V
C681	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V
C683	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V
C685	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V
C687	1-162-638-11	CERAMIC CHIP 1uF 16V

< CONNECTOR >

Ref. No.	Part No.	Description
CN650	1-565-528-11	PIN, CONNECTOR (PC BOARD) 3P
CN652	1-565-874-11	PIN, CONNECTOR (PC BOARD) 2P

< DIODE >

Ref. No.	Part No.	Description
D652	8-719-106-43	DIODE RD9.1M-B1
D655	8-719-404-46	DIODE MA110

< IC >

Ref. No.	Part No.	Description
IC650	8-759-822-37	IC LA7293M-TE-L

< JACK >

Ref. No.	Part No.	Description
J650	1-507-899-31	JACK (SMALL TYPE)
J651	1-563-454-11	JACK, MINIATURE

< COIL >

Ref. No.	Part No.	Description
L650	1-410-369-11	INDUCTOR CHIP 1uH
L652	1-410-192-51	INDUCTOR CHIP 1uH
L653	1-410-192-51	INDUCTOR CHIP 1uH
L654	1-410-369-11	INDUCTOR CHIP 1uH

< TRANSISTOR >

Ref. No.	Part No.	Description
Q650	8-729-109-44	TRANSISTOR 2SK94
Q651	8-729-905-35	TRANSISTOR 2SC4081-R

< RESISTOR >

Ref. No.	Part No.	Description
R650	1-216-833-11	METAL CHIP 10K 5% 1/16W
R651	1-216-818-11	METAL CHIP 560 5% 1/16W
R652	1-216-833-11	METAL CHIP 10K 5% 1/16W
R653	1-216-844-11	METAL CHIP 82K 5% 1/16W
R654	1-216-845-11	METAL CHIP 100K 5% 1/16W
R655	1-216-826-11	METAL CHIP 2.7K 5% 1/16W
R656	1-216-828-11	METAL CHIP 3.9K 5% 1/16W
R664	1-216-831-11	METAL CHIP 6.8K 5% 1/16W
R665	1-216-837-11	METAL CHIP 22K 5% 1/16W
R675	1-216-864-11	METAL CHIP 0
R680	1-216-857-11	METAL CHIP 1M 5% 1/16W
R681	1-216-841-11	METAL CHIP 47K 5% 1/16W
R682	1-216-864-11	METAL CHIP 0
R696	1-216-864-11	METAL CHIP 0

< SWITCH >

Ref. No.	Part No.	Description
S650	1-553-977-00	SWITCH, SLIDE (BUILT-IN MIC-WIND)
S651	1-571-787-41	SWITCH, TACTILE (REC START/STOP)

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Ref. No.	Part No.	Description
	* A-7062-751-A	RM-50 BOARD, COMPLETE

****

(Ref.No 5,000 Series)

< IC >

Ref. No.	Part No.	Description
IC960	8-749-921-76	IC GP1U56

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Ref. No.	Part No.	Description
	* A-7062-681-A	SS-136 BOARD, COMPLETE

****

(Ref.No 3,000 Series)

Ref. No.	Part No.	Description
	1-633-923-11	FP-252 FLEXIBLE BOARD
	1-633-924-11	FP-248 FLEXIBLE BOARD
	3-831-441-11	CLOTH, UNWEAVED (25X6X0.5)

< CAPACITOR >

Ref. No.	Part No.	Description
C400	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V
C401	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V
C402	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V
C409	1-163-038-00	CERAMIC CHIP 0.1uF 25V
C501	1-126-157-11	ELECT 10uF 20% 16V
C502	1-126-160-11	ELECT 1uF 20% 50V
C504	1-163-038-00	CERAMIC CHIP 0.1uF 25V
C505	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V
C506	1-126-163-11	ELECT 4.7uF 20% 50V
C507	1-164-330-21	CERAMIC CHIP 0.22uF 10% 16V

SS-136

Ref. No.	Part No.	Description			Remark
C508	1-164-330-21	CERAMIC CHIP	0.22uF	10%	16V
C509	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C510	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C511	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C512	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C513	1-128-078-11	ELECT	33uF	20%	10V
C514	1-130-495-00	MYLAR	0.1uF	5%	50V
C515	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C516	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C517	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C518	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C519	1-164-330-21	CERAMIC CHIP	0.22uF	10%	16V
C520	1-164-330-21	CERAMIC CHIP	0.22uF	10%	16V
C521	1-164-330-21	CERAMIC CHIP	0.22uF	10%	16V
C522	1-162-638-11	CERAMIC CHIP	1uF		16V
C523	1-128-078-11	ELECT	33uF	20%	10V
C524	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C525	1-126-162-11	ELECT	3.3uF	20%	50V
C526	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C528	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C529	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C530	1-126-157-11	ELECT	10uF	20%	16V
C531	1-126-157-11	ELECT	10uF	20%	16V
C532	1-162-961-11	CERAMIC CHIP	330PF	10%	50V
C533	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C534	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C535	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C536	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C537	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C538	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C539	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C540	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C541	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C542	1-164-247-11	CERAMIC CHIP	0.047uF	10%	16V
C543	1-164-247-11	CERAMIC CHIP	0.047uF	10%	16V
C545	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C546	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C547	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C548	1-162-638-11	CERAMIC CHIP	1uF		16V
C549	1-162-638-11	CERAMIC CHIP	1uF		16V
C550	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C551	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V
C552	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C553	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C554	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C555	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C556	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C557	1-163-081-00	CERAMIC CHIP	0.22uF		25V
C559	1-162-921-11	CERAMIC CHIP	33PF	5%	50V

Ref. No.	Part No.	Description			Remark
C560	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C561	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C562	1-126-157-11	ELECT	10uF	20%	16V
C563	1-126-157-11	ELECT	10uF	20%	16V
C564	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C565	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C566	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C567	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C568	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C569	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C592	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C609	1-128-078-11	ELECT	33uF	20%	10V
C610	1-124-589-11	ELECT	47uF	20%	16V
C620	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C625	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C720	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C901	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C902	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C903	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C904	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C905	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C906	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C907	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C908	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C909	1-128-078-11	ELECT	33uF	20%	10V
C910	1-128-078-11	ELECT	33uF	20%	10V
C911	1-128-078-11	ELECT	33uF	20%	10V
C912	1-127-558-11	ELECT(SOLID)	10uF	20%	10V
C913	1-128-078-11	ELECT	33uF	20%	10V
C914	1-127-561-11	ELECT(SOLID)	33uF	20%	10V
C915	1-127-558-11	ELECT(SOLID)	10uF	20%	10V
C916	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C917	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C918	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C920	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C921	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C922	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C923	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C925	1-164-217-11	CERAMIC CHIP	150PF	0.25PF	50V
C930	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C931	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C932	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C935	1-164-156-11	CERAMIC CHIP	0.1uF		25V

< CONNECTOR >

Ref. No.	Part No.	Description
CN501	* 1-565-211-11	CONNECTOR, FPC (ZIF) 22P
CN502	1-569-364-21	CONNECTOR, FPC 19P
CN503	1-565-878-11	PIN, CONNECTOR (PC BOARD) 6P
CN505	1-565-874-11	PIN, CONNECTOR (PC BOARD) 2P

Ref. No.	Part No.	Description	Remark
CN506	1-569-627-11	CONNECTOR, BOARD TO BOARD 16P	
CN507	1-569-626-11	CONNECTOR, BOARD TO BOARD 20P	
CN508	1-565-530-11	PIN, CONNECTOR (PC BOARD) 5P	
CN509	1-568-207-11	CONNECTOR, FPC (ZIF) 23P	

< DIODE >

Ref. No.	Part No.	Description	Remark
D501	8-719-941-86	DIODE DAN202U	
D506	8-719-941-86	DIODE DAN202U	
D510	8-719-404-46	DIODE MA110	
D901	8-719-938-75	DIODE SB05-05CP	
D902	8-719-938-75	DIODE SB05-05CP	
D903	8-719-938-78	DIODE SB10-05PCP	

< IC >

Ref. No.	Part No.	Description	Remark
IC501	8-752-818-70	IC CXP80116-830Q	
IC502	8-759-148-05	IC CXA8010M	
IC503	8-759-990-55	IC CXA8006M	
IC504	8-759-805-06	IC CXA1127M	
IC506	8-752-035-48	IC CXA1204Q	
IC507	8-759-998-92	IC LM393D	
IC508	8-759-748-65	IC BR93CS46F	
IC901	8-759-500-42	IC MB3783PFV	

< COIL >

Ref. No.	Part No.	Description	Remark
L503	1-408-795-21	INDUCTOR, CHIP 330uH	
L505	1-410-381-11	INDUCTOR, CHIP 10uH	
L515	1-412-028-11	INDUCTOR, CHIP 4.7uH	
L901	1-424-104-11	COIL, CHOKE 10uH	
L902	1-424-104-11	COIL, CHOKE 10uH	
L903	1-424-106-11	COIL, CHOKE 47uH	
L904	1-424-106-11	COIL, CHOKE 47uH	
L905	1-424-105-11	COIL, CHOKE 22uH	
L906	1-412-027-11	INDUCTOR CHIP 2.2uH	
L907	1-412-029-11	INDUCTOR, CHIP 10uH	
L908	1-412-029-11	INDUCTOR, CHIP 10uH	
L909	1-412-029-11	INDUCTOR, CHIP 10uH	

< IC LINK >

Ref. No.	Part No.	Description	Remark
PS501 ⚠	1-532-605-00	LINK, IC (ICP-N10 0.4A)	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q400	8-729-905-35	TRANSISTOR 2SC4081-R	
Q401	8-729-905-35	TRANSISTOR 2SC4081-R	
Q402	8-729-905-35	TRANSISTOR 2SC4081-R	
Q502	8-729-905-35	TRANSISTOR 2SC4081-R	
Q503	8-729-905-24	TRANSISTOR 2SA1576-S	
Q505	8-729-905-35	TRANSISTOR 2SC4081-R	
Q506	8-729-905-24	TRANSISTOR 2SA1576-S	
Q507	8-729-905-35	TRANSISTOR 2SC4081-R	
Q508	8-729-905-24	TRANSISTOR 2SA1576-S	
Q509	8-729-905-35	TRANSISTOR 2SC4081-R	
Q510	8-729-905-35	TRANSISTOR 2SC4081-R	
Q511	8-729-905-24	TRANSISTOR 2SA1576-S	
Q512	8-729-907-00	TRANSISTOR DTC114EU	
Q513	8-729-905-35	TRANSISTOR 2SC4081-R	
Q514	8-729-905-35	TRANSISTOR 2SC4081-R	
Q515	8-729-905-18	TRANSISTOR DTC144EU	
Q516	8-729-905-18	TRANSISTOR DTC144EU	
Q540	8-729-822-48	TRANSISTOR FC101	
Q901	8-729-805-25	TRANSISTOR 2SB1121	
Q902	8-729-805-25	TRANSISTOR 2SB1121	
Q903	8-729-805-25	TRANSISTOR 2SB1121	
Q904	8-729-820-47	TRANSISTOR 2SB1202FAT	
Q905	8-729-905-35	TRANSISTOR 2SC4081-R	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R400	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R401	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R402	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R403	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R404	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R405	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R406	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R407	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R408	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R409	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R417	1-216-864-11	METAL CHIP 0	
R418	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R419	1-216-864-11	METAL CHIP 0	
R501	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R502	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R503	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R504	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R506	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R507	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R508	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R510	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R511	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R512	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R513	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R514	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R515	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R516	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R517	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R518	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R519	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
R520	1-216-833-11	METAL CHIP	10K	5%	1/16W
R521	1-216-845-11	METAL CHIP	100K	5%	1/16W
R522	1-216-833-11	METAL CHIP	10K	5%	1/16W
R523	1-216-845-11	METAL CHIP	100K	5%	1/16W
R524	1-216-833-11	METAL CHIP	10K	5%	1/16W
R525	1-216-845-11	METAL CHIP	100K	5%	1/16W
R526	1-216-833-11	METAL CHIP	10K	5%	1/16W
R527	1-216-845-11	METAL CHIP	100K	5%	1/16W
R528	1-216-833-11	METAL CHIP	10K	5%	1/16W
R529	1-216-845-11	METAL CHIP	100K	5%	1/16W
R530	1-216-833-11	METAL CHIP	10K	5%	1/16W
R531	1-216-845-11	METAL CHIP	100K	5%	1/16W
R532	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R534	1-216-845-11	METAL CHIP	100K	5%	1/16W
R535	1-216-843-11	METAL CHIP	68K	5%	1/16W
R536	1-216-857-11	METAL CHIP	1M	5%	1/16W
R537	1-216-833-11	METAL CHIP	10K	5%	1/16W
R538	1-216-833-11	METAL CHIP	10K	5%	1/16W
R539	1-216-833-11	METAL CHIP	10K	5%	1/16W
R540	1-216-845-11	METAL CHIP	100K	5%	1/16W
R541	1-216-833-11	METAL CHIP	10K	5%	1/16W
R542	1-216-837-11	METAL CHIP	22K	5%	1/16W
R543	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R544	1-216-837-11	METAL CHIP	22K	5%	1/16W
R545	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R546	1-216-837-11	METAL CHIP	22K	5%	1/16W
R547	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R548	1-217-671-11	METAL CHIP	1	5%	1/10W
R549	1-217-671-11	METAL CHIP	1	5%	1/10W
R550	1-217-671-11	METAL CHIP	1	5%	1/10W
R551	1-217-671-11	METAL CHIP	1	5%	1/10W
R552	1-216-037-00	METAL CHIP	330	5%	1/10W
R553	1-216-833-11	METAL CHIP	10K	5%	1/16W
R555	1-216-845-11	METAL CHIP	100K	5%	1/16W
R556	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R558	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R559	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R560	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R561	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R562	1-216-813-11	METAL CHIP	220	5%	1/16W
R563	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R564	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R565	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R566	1-216-833-11	METAL CHIP	10K	5%	1/16W
R567	1-216-833-11	METAL CHIP	10K	5%	1/16W
R568	1-216-817-11	METAL CHIP	470	5%	1/16W
R569	1-216-817-11	METAL CHIP	470	5%	1/16W
R571	1-216-841-11	METAL CHIP	47K	5%	1/16W
R572	1-216-841-11	METAL CHIP	47K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R573	1-216-841-11	METAL CHIP	47K	5%	1/16W
R574	1-216-841-11	METAL CHIP	47K	5%	1/16W
R575	1-216-817-11	METAL CHIP	470	5%	1/16W
R576	1-216-813-11	METAL CHIP	220	5%	1/16W
R577	1-216-811-11	METAL CHIP	150	5%	1/16W
R578	1-216-817-11	METAL CHIP	470	5%	1/16W
R579	1-216-803-11	METAL CHIP	33	5%	1/16W
R582	1-216-864-11	METAL CHIP	0		
R583	1-216-833-11	METAL CHIP	10K	5%	1/16W
R586	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R587	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R589	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R590	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R591	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R592	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R594	1-216-835-11	METAL CHIP	15K	5%	1/16W
R595	1-216-839-11	METAL CHIP	33K	5%	1/16W
R596	1-216-833-11	METAL CHIP	10K	5%	1/16W
R597	1-216-821-11	METAL CHIP	1K	5%	1/16W
R598	1-216-809-11	METAL CHIP	100	5%	1/16W
R599	1-216-809-11	METAL CHIP	100	5%	1/16W
R600	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R601	1-216-839-11	METAL CHIP	33K	5%	1/16W
R602	1-216-839-11	METAL CHIP	33K	5%	1/16W
R603	1-216-857-11	METAL CHIP	1M	5%	1/16W
R604	1-216-837-11	METAL CHIP	22K	5%	1/16W
R605	1-216-833-11	METAL CHIP	10K	5%	1/16W
R606	1-216-837-11	METAL CHIP	22K	5%	1/16W
R607	1-216-857-11	METAL CHIP	1M	5%	1/16W
R608	1-216-854-11	METAL CHIP	560K	5%	1/16W
R609	1-216-833-11	METAL CHIP	10K	5%	1/16W
R610	1-216-845-11	METAL CHIP	100K	5%	1/16W
R611	1-216-845-11	METAL CHIP	100K	5%	1/16W
R613	1-216-845-11	METAL CHIP	100K	5%	1/16W
R614	1-216-833-11	METAL CHIP	10K	5%	1/16W
R615	1-216-851-11	METAL CHIP	330K	5%	1/16W
R616	1-216-857-11	METAL CHIP	1M	5%	1/16W
R618	1-216-847-11	METAL CHIP	150K	5%	1/16W
R619	1-216-837-11	METAL CHIP	22K	5%	1/16W
R620	1-216-837-11	METAL CHIP	22K	5%	1/16W
R621	1-216-857-11	METAL CHIP	1M	5%	1/16W
R622	1-216-821-11	METAL CHIP	1K	5%	1/16W
R623	1-216-833-11	METAL CHIP	10K	5%	1/16W
R624	1-216-833-11	METAL CHIP	10K	5%	1/16W
R625	1-216-845-11	METAL CHIP	100K	5%	1/16W
R626	1-216-833-11	METAL CHIP	10K	5%	1/16W
R627	1-216-833-11	METAL CHIP	10K	5%	1/16W
R628	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R629	1-216-182-00	METAL GLAZE	220	5%	1/8W

Ref. No.	Part No.	Description			Remark
R630	1-216-182-00	METAL GLAZE	220	5%	1/8W
R631	1-216-815-11	METAL CHIP	330	5%	1/16W
R632	1-216-813-11	METAL CHIP	220	5%	1/16W
R689	1-216-841-11	METAL CHIP	47K	5%	1/16W
R714	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R715	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R716	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R717	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R719	1-216-841-11	METAL CHIP	47K	5%	1/16W
R720	1-216-841-11	METAL CHIP	47K	5%	1/16W
R726	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R727	1-216-833-11	METAL CHIP	10K	5%	1/16W
R728	1-216-821-11	METAL CHIP	1K	5%	1/16W
R730	1-216-837-11	METAL CHIP	22K	5%	1/16W
R735	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R761	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R762	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R763	1-216-837-11	METAL CHIP	22K	5%	1/16W
R764	1-216-857-11	METAL CHIP	1M	5%	1/16W
R765	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R810	1-216-841-11	METAL CHIP	47K	5%	1/16W
R811	1-216-821-11	METAL CHIP	1K	5%	1/16W
R812	1-216-821-11	METAL CHIP	1K	5%	1/16W
R813	1-216-821-11	METAL CHIP	1K	5%	1/16W
R840	1-216-296-00	METAL CHIP	0	5%	1/8W
R841	1-216-296-00	METAL CHIP	0	5%	1/8W
R842	1-216-296-00	METAL CHIP	0	5%	1/8W
R850	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R851	1-216-864-11	METAL CHIP	0		
R855	1-216-809-11	METAL CHIP	100	5%	1/16W
R857	1-216-861-11	METAL CHIP	2.2M	5%	1/16W
R901	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R902	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R903	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R904	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R905	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R906	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R907	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R908	1-216-166-00	METAL GLAZE	47	5%	1/8W
R909	1-216-166-00	METAL GLAZE	47	5%	1/8W
R910	1-216-164-00	METAL GLAZE	39	5%	1/8W
R911	1-216-845-11	METAL CHIP	100K	5%	1/16W
R912	1-216-833-11	METAL CHIP	10K	5%	1/16W
R913	1-216-813-11	METAL CHIP	220	5%	1/16W
R914	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R915	1-216-833-11	METAL CHIP	10K	5%	1/16W
R916	1-216-833-11	METAL CHIP	10K	5%	1/16W
R924	1-216-821-11	METAL CHIP	1K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R927	1-216-833-11	METAL CHIP	10K	5%	1/16W
		< VARIABLE RESISTOR >			
RV901	1-238-089-11	RES, ADJ CERMET4.7K			
RV902	1-238-087-11	RES, ADJ CERMET1K			
		< CONNECTOR >			
W505	1-562-880-11	CONNECTOR, CARD EDGE 15P			
W510	1-569-346-11	CONNECTOR, FPC (TRANSLATION) 10P			
		< CRYSTAL >			
X501	1-577-467-21	VIBRATOR, CRYSTAL (16MHz)			
X502	1-567-827-11	VIBRATOR, CRYSTAL (5.86MHz)			

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* A-7071-416-A SW-183 BOARD, COMPLETE
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(Ref.No 4,000 Series)

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
CN930	* 1-566-761-11	PIN, CONNECTOR (PC BOARD) 6P	
CN931	1-575-846-11	CONNECTOR, FPC (NON ZIF) 6P	
		< DIODE >	
D900	8-719-977-34	DIODE DTZ12	
D901	8-719-977-34	DIODE DTZ12	
D902	8-719-404-46	DIODE MA110	
D903	8-719-977-34	DIODE DTZ12	
D905	8-719-404-46	DIODE MA110	
D906	8-719-404-46	DIODE MA110	
D907	8-719-404-46	DIODE MA110	
D908	8-719-976-97	DIODE DTZ5.1	
		< JACK >	
J900	1-507-929-41	JACK (HEADPHONE)	
J901	1-565-276-21	JACK, ULTRA SMALL 1P (REMOTE)	
		< COIL >	
L900	1-410-369-11	INDUCTOR CHIP 1uH	
L901	1-410-369-11	INDUCTOR CHIP 1uH	
L903	1-410-192-51	INDUCTOR CHIP 1uH	
L904	1-410-369-11	INDUCTOR CHIP 1uH	
L905	1-410-369-11	INDUCTOR CHIP 1uH	
		< TRANSISTOR >	
Q900	8-729-901-01	TRANSISTOR DTC144EK	
Q901	8-729-902-XX	TRANSISTOR DTC114TK	

< RESISTOR >

Ref. No.	Part No.	Description			Remark
R900	1-216-073-00	METAL CHIP	10K	5%	1/10W
R901	1-216-073-00	METAL CHIP	10K	5%	1/10W
R902	1-216-295-00	METAL CHIP	0	5%	1/10W

< SWITCH >

Ref. No.	Part No.	Description
S900	1-570-870-11	SWITCH, SLIDE (STANDBY/LOCK)
S901	1-571-838-11	SWITCH, TACTIL (START/STOP)

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* A-7062-749-A VA-67 BOARD, COMPLETE (AEP/UK)
****
* A-7062-842-A VA-67 BOARD, COMPLETE (E)
****
(Ref.No 2,000 Series)

3-719-695-01 SCREW (M1.7X3.5), SPECIAL HEAD
3-744-842-01 SUPPORT, CT PC BOARD

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C002	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C071	1-128-004-11	ELECT CHIP	10uF	20%	16V
C072	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C101	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C102	1-128-004-11	ELECT CHIP	10uF	20%	16V
C103	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C104	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C105	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C108	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C109	1-162-937-11	CERAMIC CHIP	6PF	0.5PF	50V
C110	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C111	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C112	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C113	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C114	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C115	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C117	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C121	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C122	1-128-004-11	ELECT CHIP	10uF	20%	16V
C123	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C126	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C127	1-164-382-11	CERAMIC CHIP	91PF	5%	50V
C129	1-162-956-11	CERAMIC CHIP	180PF	5%	50V
C141	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C143	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C144	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C146	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C147	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C171	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C172	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C181	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C183	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C200	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C201	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C202	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C203	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C204	1-128-004-11	ELECT CHIP	10uF	20%	16V
C205	1-128-004-11	ELECT CHIP	10uF	20%	16V
C206	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C207	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C208	1-128-004-11	ELECT CHIP	10uF	20%	16V
C209	1-126-154-11	ELECT	47uF	20%	6.3V
C210	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C211	1-128-004-11	ELECT CHIP	10uF	20%	16V
C212	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C213	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C214	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C215	1-128-004-11	ELECT CHIP	10uF	20%	16V
C216	1-126-607-11	ELECT CHIP	47uF	20%	4V
C218	1-126-209-11	ELECT CHIP	100uF	20%	4V
C219	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C220	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C221	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C222	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C224	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C225	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C226	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C227	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C228	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C229	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C230	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C231	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C232	1-162-638-11	CERAMIC CHIP	1uF		16V
C233	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C234	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C235	1-128-004-11	ELECT CHIP	10uF	20%	16V
C236	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C237	1-128-004-11	ELECT CHIP	10uF	20%	16V
C238	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C239	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C240	1-128-004-11	ELECT CHIP	10uF	20%	16V
C241	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C242	1-128-003-11	ELECT CHIP	22uF	20%	4V
C246	1-128-003-11	ELECT CHIP	22uF	20%	4V
C247	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C248	1-128-004-11	ELECT CHIP	10uF	20%	16V
C249	1-128-004-11	ELECT CHIP	10uF	20%	16V
C250	1-128-004-11	ELECT CHIP	10uF	20%	16V

Ref. No.	Part No.	Description			Remark
C251	1-128-004-11	ELECT CHIP	10uF	20%	16V
C252	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C253	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C254	1-128-004-11	ELECT CHIP	10uF	20%	16V
C255	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C256	1-126-246-11	ELECT CHIP	220uF	20%	4V
C257	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C258	1-128-004-11	ELECT CHIP	10uF	20%	16V
C259	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C262	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C263	1-126-207-11	ELECT CHIP	33uF	20%	4V
C264	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C265	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C267	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C268	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C269	1-128-004-11	ELECT CHIP	10uF	20%	16V
C270	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C271	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C273	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C274	1-128-004-11	ELECT CHIP	10uF	20%	16V
C275	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C276	1-128-004-11	ELECT CHIP	10uF	20%	16V
C277	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C278	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C279	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C280	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C284	1-128-004-11	ELECT CHIP	10uF	20%	16V
C285	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C286	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C287	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C288	1-128-292-11	ELECT	220uF	20%	10V
C289	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C301	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C302	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C303	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C305	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C306	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C307	1-128-004-11	ELECT CHIP	10uF	20%	16V
C308	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C309	1-135-176-21	TANTALUM CHIP	0.68uF	10%	20V
C310	1-128-013-11	ELECT CHIP	1uF	20%	50V
C311	1-128-013-11	ELECT CHIP	1uF	20%	50V
C312	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C315	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C316	1-128-004-11	ELECT CHIP	10uF	20%	16V
C317	1-128-004-11	ELECT CHIP	10uF	20%	16V
C318	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C319	1-164-217-11	CERAMIC CHIP	150PF	0.25PF	50V
C320	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C321	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C322	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C323	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C324	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C325	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C326	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C327	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C328	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C329	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C330	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C331	1-128-004-11	ELECT CHIP	10uF	20%	16V
C332	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C333	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C334	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C335	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C336	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C337	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C338	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C339	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C340	1-162-937-11	CERAMIC CHIP	6PF	0.5PF	50V
C342	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C352	1-128-013-11	ELECT CHIP	1uF	20%	50V
C353	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C354	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C355	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C357	1-128-004-11	ELECT CHIP	10uF	20%	16V
C358	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C359	1-163-118-00	CERAMIC CHIP	110PF	5%	50V
C360	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C361	1-128-007-11	ELECT CHIP	2.2uF	20%	35V
C362	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C363	1-164-145-11	CERAMIC CHIP	390PF	5%	50V
C364	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C365	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C366	1-162-936-11	CERAMIC CHIP	5PF	0.25PF	50V
C367	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C368	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C370	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C371	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C400	1-162-971-11	CERAMIC CHIP	0.001uF		50V (E)
C402	1-162-971-11	CERAMIC CHIP	0.001uF		50V
C403	1-162-971-11	CERAMIC CHIP	0.001uF		50V
C405	1-162-971-11	CERAMIC CHIP	0.001uF		50V
C406	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C407	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C408	1-124-779-00	ELECT CHIP	10uF	20%	16v
C409	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C411	1-126-205-11	ELECT CHIP	47uF	20%	6.3V

Ref. No.	Part No.	Description	Remark
C412	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C414	1-126-206-11	ELECT CHIP 100uF 20% 6.3V	
C416	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C417	1-163-989-11	CERAMIC CHIP 0.033uF 10% 25V	
C418	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C419	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C421	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C422	1-162-638-11	CERAMIC CHIP 1uF 16V	
C423	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C424	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C427	1-162-969-11	CERAMIC CHIP 0.0068uF 10% 25V	
C429	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C430	1-126-607-11	ELECT CHIP 47uF 20% 4V	
C431	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C432	1-128-003-11	ELECT CHIP 22uF 20% 4V	
C434	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C435	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C436	1-128-006-11	ELECT CHIP 4.7uF 20% 25V	
C437	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C439	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C441	1-162-637-11	CERAMIC CHIP 0.47uF 16V	(E)
C469	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C615	1-162-950-11	CERAMIC CHIP 56PF 5% 50V	
C620	1-162-954-11	CERAMIC CHIP 0.001uF 10% 50V	(E)
		< FILTER >	
CF301	1-577-162-11	FILTER, CERAMIC	
		< CONNECTOR >	
CN401	* 1-566-761-11	PIN, CONNECTOR (PC BOARD) 6P	
CN506	1-569-486-11	CONNECTOR, BOARD TO BOARD 16P	
CN507	1-569-485-11	CONNECTOR, BOARD TO BOARD 20P	
CN508	1-569-478-21	CONNECTOR, FPC 20P	
CN601	* 1-566-764-11	PIN, CONNECTOR (PC BOARD) 9P	
CN703	1-568-359-41	CONNECTOR, BOARD TO BOARD 20P	
CN704	1-569-363-21	CONNECTOR, FPC 15P	
CN901	1-566-524-21	CONNECTOR, FPC (ZIF) 8P	
		< DIODE >	
D101	8-719-800-76	DIODE 1SS226	
D202	8-719-941-86	DIODE DAN202U	
D203	8-719-941-86	DIODE DAN202U	
D205	8-719-941-86	DIODE DAN202U	
D208	8-719-941-86	DIODE DAN202U	
D209	8-719-941-86	DIODE DAN202U	
D210	8-719-404-46	DIODE MA110	
D214	8-719-940-45	DIODE DWA010	
D215	8-719-404-46	DIODE MA110	
D216	8-719-404-46	DIODE MA110	
D217	8-719-801-41	DIODE 1SS196	
D218	8-719-800-76	DIODE 1SS226	
D351	8-719-404-46	DIODE MA110	
		< FILTER >	
FL201	1-236-751-21	FILTER, LOW PASS	
FL202	1-415-764-21	DELAY LINE, LC	
FL203	1-236-848-21	FILTER, LOW PASS	
FL204	1-415-818-11	DELAY LINE, LC (Y)	
FL205	1-239-055-21	FILTER, LOW PASS (CCD. PAL. Y)	
FL301	1-236-849-21	FILTER, BAND PASS	
FL302	1-236-186-11	FILTER, BAND PASS	
FL303	1-236-850-21	FILTER, BAND PASS	
		< IC >	
IC001	8-759-999-02	IC TL1596CDB	
IC201	8-752-036-19	IC CXA1207R	
IC202	8-752-333-24	IC CXL1506M	
IC203	8-752-036-20	IC CXA1208R	
IC204	8-759-605-61	IC CXA1203N	
IC205	8-759-710-29	IC NJM2235M	
IC206	8-759-320-76	IC HA118070FP	
IC207	8-759-710-07	IC NJM2234M	
IC400	8-759-823-20	IC CXA-1488R	
		< JACK >	
J201	1-537-142-21	TERMINAL BOARD **(VIDEO/AUDIO/DC OUT)**	
		< COIL >	
L101	1-412-032-11	INDUCTOR, CHIP 100uH	
L102	1-412-280-31	INDUCTOR 330uH	
L103	1-410-167-41	INDUCTOR, CHIP 820uH	
L105	1-410-657-21	INDUCTOR, CHIP 180uH	
L106	1-410-387-11	INDUCTOR, CHIP 33uH	
L109	1-410-381-11	INDUCTOR, CHIP 10uH	
L110	1-410-658-31	INDUCTOR, CHIP 220uH	
L122	1-410-658-31	INDUCTOR, CHIP 220uH	
L123	1-410-655-31	INDUCTOR, CHIP 120uH	
L124	1-412-280-31	INDUCTOR 330uH	
L125	1-410-380-31	INDUCTOR, CHIP 8.2uH	
L126	1-412-032-11	INDUCTOR, CHIP 100uH	
L129	1-412-026-11	INDUCTOR, CHIP 1uH	
L171	1-410-392-11	INDUCTOR, CHIP 82uH	
L181	1-412-026-11	INDUCTOR, CHIP 1uH	
L201	1-410-390-11	INDUCTOR, CHIP 56uH	
L203	1-410-370-31	INDUCTOR, CHIP 1.2uH	
L204	1-410-391-11	INDUCTOR, CHIP 68uH	
L205	1-412-031-11	INDUCTOR, CHIP 47uH	
L206	1-412-031-11	INDUCTOR, CHIP 47uH	

Ref. No.	Part No.	Description	Remark
L209	1-412-031-11	INDUCTOR, CHIP 47uH	
L210	1-410-393-11	INDUCTOR, CHIP 100uH	
L211	1-410-375-11	INDUCTOR, CHIP 3.3uH	
L212	1-410-379-21	INDUCTOR, CHIP 6.8uH	
L214	1-410-377-31	INDUCTOR, CHIP 4.7uH	
L301	1-410-393-11	INDUCTOR, CHIP 100uH	
L302	1-410-386-11	INDUCTOR, CHIP 27uH	
L304	1-410-393-11	INDUCTOR, CHIP 100uH	
L305	1-410-393-11	INDUCTOR, CHIP 100uH	
L306	1-410-655-31	INDUCTOR, CHIP 120uH	
L307	1-410-656-11	INDUCTOR, CHIP 150uH	
L309	1-410-379-21	INDUCTOR, CHIP 6.8uH	
L400	1-410-384-31	INDUCTOR, CHIP 18uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q001	8-729-905-23	TRANSISTOR 2SA1576-R	
Q002	8-729-905-35	TRANSISTOR 2SC4081-R	
Q004	8-729-905-35	TRANSISTOR 2SC4081-R	
Q005	8-729-905-35	TRANSISTOR 2SC4081-R	
Q060	8-729-905-18	TRANSISTOR DTC144EU	
Q061	8-729-905-18	TRANSISTOR DTC144EU	
Q062	8-729-905-18	TRANSISTOR DTC144EU	
Q063	8-729-905-12	TRANSISTOR DTA144EU	
Q101	8-729-905-23	TRANSISTOR 2SA1576-R	
Q102	8-729-905-18	TRANSISTOR DTC144EU	
Q105	8-729-905-35	TRANSISTOR 2SC4081-R	
Q106	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q107	8-729-905-12	TRANSISTOR DTA144EU	
Q109	8-729-905-35	TRANSISTOR 2SC4081-R	
Q115	8-729-905-23	TRANSISTOR 2SA1576-R	
Q116	8-729-905-18	TRANSISTOR DTC144EU	
Q119	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q121	8-729-905-23	TRANSISTOR 2SA1576-R	
Q122	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q123	8-729-905-35	TRANSISTOR 2SC4081-R	
Q130	8-729-905-35	TRANSISTOR 2SC4081-R	
Q131	8-729-905-23	TRANSISTOR 2SA1576-R	
Q140	8-729-905-12	TRANSISTOR DTA144EU	
Q141	8-729-905-35	TRANSISTOR 2SC4081-R	
Q142	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q154	8-729-905-35	TRANSISTOR 2SC4081-R	
Q171	8-729-905-35	TRANSISTOR 2SC4081-R	
Q172	8-729-905-35	TRANSISTOR 2SC4081-R	
Q191	8-729-905-35	TRANSISTOR 2SC4081-R	
Q192	8-729-905-18	TRANSISTOR DTC144EU	
Q195	8-729-905-12	TRANSISTOR DTA144EU	
Q196	8-729-905-18	TRANSISTOR DTC144EU	
Q201	8-729-905-35	TRANSISTOR 2SC4081-R	
Q202	8-729-905-12	TRANSISTOR DTA144EU	
Q203	8-729-905-23	TRANSISTOR 2SA1576-R	
Q204	8-729-905-35	TRANSISTOR 2SC4081-R	
Q206	8-729-905-35	TRANSISTOR 2SC4081-R	
Q209	8-729-905-18	TRANSISTOR DTC144EU	
Q210	8-729-905-23	TRANSISTOR 2SA1576-R	
Q211	8-729-905-35	TRANSISTOR 2SC4081-R	
Q212	8-729-905-35	TRANSISTOR 2SC4081-R	
Q215	8-729-905-23	TRANSISTOR 2SA1576-R	
Q220	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q221	8-729-905-18	TRANSISTOR DTC144EU	
Q222	8-729-905-12	TRANSISTOR DTA144EU	
Q223	8-729-905-35	TRANSISTOR 2SC4081-R	
Q224	8-729-905-35	TRANSISTOR 2SC4081-R	
Q225	8-729-905-12	TRANSISTOR DTA144EU	
Q226	8-729-905-35	TRANSISTOR 2SC4081-R	
Q227	8-729-905-35	TRANSISTOR 2SC4081-R	
Q228	8-729-905-23	TRANSISTOR 2SA1576-R	
Q229	8-729-905-35	TRANSISTOR 2SC4081-R	
Q231	8-729-905-35	TRANSISTOR 2SC4081-R	
Q232	8-729-905-35	TRANSISTOR 2SC4081-R	
Q238	8-729-905-23	TRANSISTOR 2SA1576-R	
Q240	8-729-905-35	TRANSISTOR 2SC4081-R	
Q241	8-729-905-23	TRANSISTOR 2SA1576-R	
Q243	8-729-905-18	TRANSISTOR DTC144EU	
Q244	8-729-905-18	TRANSISTOR DTC144EU	
Q245	8-729-905-XX	TRANSISTOR DTC114TU	
Q246	8-729-905-XX	TRANSISTOR DTC114TU	
Q247	8-729-905-XX	TRANSISTOR DTC114TU	
Q248	8-729-905-18	TRANSISTOR DTC144EU	
Q250	8-729-905-35	TRANSISTOR 2SC4081-R	
Q251	8-729-905-18	TRANSISTOR DTC144EU	
Q301	8-729-905-23	TRANSISTOR 2SA1576-R	
Q303	8-729-905-35	TRANSISTOR 2SC4081-R	
Q304	8-729-905-35	TRANSISTOR 2SC4081-R	
Q306	8-729-905-35	TRANSISTOR 2SC4081-R	
Q307	8-729-905-18	TRANSISTOR DTC144EU	
Q310	8-729-905-35	TRANSISTOR 2SC4081-R	
Q311	8-729-905-35	TRANSISTOR 2SC4081-R	
Q351	8-729-905-35	TRANSISTOR 2SC4081-R	
Q352	8-729-905-35	TRANSISTOR 2SC4081-R	
Q353	8-729-905-35	TRANSISTOR 2SC4081-R	
Q354	8-729-905-35	TRANSISTOR 2SC4081-R	
Q356	8-729-905-18	TRANSISTOR DTC144EU	
Q357	8-729-905-12	TRANSISTOR DTA144EU	
Q358	8-729-905-18	TRANSISTOR DTC144EU	
Q359	8-729-102-08	TRANSISTOR 2SC2223-F14	
Q360	8-729-905-18	TRANSISTOR DTC144EU	
Q362	8-729-905-18	TRANSISTOR DTC144EU	
Q400	8-729-905-18	TRANSISTOR DTC144EU	

VA-67

Ref. No.	Part No.	Description			Remark
Q404	8-729-904-07	TRANSISTOR	FMG2		
		< RESISTOR >			
R001	1-216-839-11	METAL CHIP	33K	5%	1/16W
R002	1-216-842-11	METAL CHIP	56K	5%	1/16W
R003	1-216-817-11	METAL CHIP	470	5%	1/16W
R004	1-216-821-11	METAL CHIP	1K	5%	1/16W
R005	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R006	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R011	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R012	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R015	1-216-809-11	METAL CHIP	100	5%	1/16W
R016	1-216-813-11	METAL CHIP	220	5%	1/16W
R017	1-216-816-11	METAL CHIP	390	5%	1/16W
R018	1-216-814-11	METAL CHIP	270	5%	1/16W
R020	1-216-818-11	METAL CHIP	560	5%	1/16W
R025	1-216-821-11	METAL CHIP	1K	5%	1/16W
R032	1-216-864-11	METAL CHIP	0		
R034	1-216-864-11	METAL CHIP	0		
R036	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R041	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R042	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R043	1-216-839-11	METAL CHIP	33K	5%	1/16W
R044	1-216-837-11	METAL CHIP	22K	5%	1/16W
R045	1-216-821-11	METAL CHIP	1K	5%	1/16W
R047	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R048	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R049	1-216-821-11	METAL CHIP	1K	5%	1/16W
R050	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R051	1-216-833-11	METAL CHIP	10K	5%	1/16W
R052	1-216-841-11	METAL CHIP	47K	5%	1/16W
R053	1-216-821-11	METAL CHIP	1K	5%	1/16W
R060	1-216-864-11	METAL CHIP	0		
R061	1-216-821-11	METAL CHIP	1K	5%	1/16W
R062	1-216-847-11	METAL CHIP	150K	5%	1/16W
R063	1-216-847-11	METAL CHIP	150K	5%	1/16W
R065	1-216-817-11	METAL CHIP	470	5%	1/16W
R066	1-216-809-11	METAL CHIP	100	5%	1/16W
R071	1-216-661-11	METAL CHIP	2.7K	0.5%	1/10W
R072	1-216-833-11	METAL CHIP	10K	5%	1/16W
R073	1-216-833-11	METAL CHIP	10K	5%	1/16W
R074	1-216-809-11	METAL CHIP	100	5%	1/16W
R076	1-216-864-11	METAL CHIP	0		(AEP/UK)
R087	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R088	1-216-821-11	METAL CHIP	1K	5%	1/16W
R089	1-216-838-11	METAL CHIP	27K	5%	1/16W
R090	1-216-833-11	METAL CHIP	10K	5%	1/16W
R093	1-216-823-11	METAL CHIP	1.5K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R097	1-216-845-11	METAL CHIP	100K	5%	1/16W
R099	1-216-833-11	METAL CHIP	10K	5%	1/16W
R101	1-216-833-11	METAL CHIP	10K	5%	1/16W
R102	1-216-833-11	METAL CHIP	10K	5%	1/16W
R103	1-216-821-11	METAL CHIP	1K	5%	1/16W
R104	1-216-811-11	METAL CHIP	150	5%	1/16W
R108	1-216-837-11	METAL CHIP	22K	5%	1/16W
R109	1-216-839-11	METAL CHIP	33K	5%	1/16W
R110	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R111	1-216-819-11	METAL CHIP	680	5%	1/16W
R112	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R113	1-216-814-11	METAL CHIP	270	5%	1/16W
R114	1-216-834-11	METAL CHIP	12K	5%	1/16W
R115	1-216-833-11	METAL CHIP	10K	5%	1/16W
R116	1-216-817-11	METAL CHIP	470	5%	1/16W
R117	1-216-808-11	METAL CHIP	82	5%	1/16W
R118	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R119	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R120	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R124	1-216-821-11	METAL CHIP	1K	5%	1/16W
R125	1-216-836-11	METAL CHIP	18K	5%	1/16W
R126	1-216-836-11	METAL CHIP	18K	5%	1/16W
R127	1-216-821-11	METAL CHIP	1K	5%	1/16W
R128	1-216-864-11	METAL CHIP	0		
R132	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R133	1-216-818-11	METAL CHIP	560	5%	1/16W
R134	1-216-818-11	METAL CHIP	560	5%	1/16W
R141	1-216-837-11	METAL CHIP	22K	5%	1/16W
R142	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R158	1-216-818-11	METAL CHIP	560	5%	1/16W
R159	1-216-837-11	METAL CHIP	22K	5%	1/16W
R160	1-216-837-11	METAL CHIP	22K	5%	1/16W
R161	1-216-817-11	METAL CHIP	470	5%	1/16W
R162	1-216-817-11	METAL CHIP	470	5%	1/16W
R163	1-216-813-11	METAL CHIP	220	5%	1/16W
R164	1-216-817-11	METAL CHIP	470	5%	1/16W
R165	1-216-809-11	METAL CHIP	100	5%	1/16W
R166	1-216-821-11	METAL CHIP	1K	5%	1/16W
R167	1-216-833-11	METAL CHIP	10K	5%	1/16W
R168	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R170	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R171	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R172	1-216-840-11	METAL CHIP	39K	5%	1/16W
R173	1-216-835-11	METAL CHIP	15K	5%	1/16W
R174	1-216-821-11	METAL CHIP	1K	5%	1/16W
R175	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R176	1-216-833-11	METAL CHIP	10K	5%	1/16W
R178	1-216-818-11	METAL CHIP	560	5%	1/16W
R181	1-216-804-11	METAL CHIP	39	5%	1/16W

Ref. No.	Part No.	Description			Remark
R182	1-216-804-11	METAL CHIP	39	5%	1/16W
R183	1-216-807-11	METAL CHIP	68	5%	1/16W
R184	1-216-138-00	METAL CHIP	3.3	5%	1/8W
R185	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R186	1-216-836-11	METAL CHIP	18K	5%	1/16W
R187	1-216-820-11	METAL CHIP	820	5%	1/16W
R188	1-216-833-11	METAL CHIP	10K	5%	1/16W
R191	1-216-841-11	METAL CHIP	47K	5%	1/16W
R192	1-216-841-11	METAL CHIP	47K	5%	1/16W
R193	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R196	1-216-864-11	METAL CHIP	0		
R201	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R202	1-216-841-11	METAL CHIP	47K	5%	1/16W
R203	1-216-813-11	METAL CHIP	220	5%	1/16W
R204	1-216-821-11	METAL CHIP	1K	5%	1/16W
R206	1-216-821-11	METAL CHIP	1K	5%	1/16W
R208	1-216-816-11	METAL CHIP	390	5%	1/16W
R209	1-216-814-11	METAL CHIP	270	5%	1/16W
R210	1-216-819-11	METAL CHIP	680	5%	1/16W
R211	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R212	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R213	1-216-817-11	METAL CHIP	470	5%	1/16W
R214	1-216-820-11	METAL CHIP	820	5%	1/16W
R215	1-216-817-11	METAL CHIP	470	5%	1/16W
R216	1-216-817-11	METAL CHIP	470	5%	1/16W
R219	1-216-833-11	METAL CHIP	10K	5%	1/16W
R220	1-216-810-11	METAL CHIP	120	5%	1/16W
R221	1-216-844-11	METAL CHIP	82K	5%	1/16W
R222	1-216-857-11	METAL CHIP	1M	5%	1/16W
R225	1-216-839-11	METAL CHIP	33K	5%	1/16W
R226	1-216-817-11	METAL CHIP	470	5%	1/16W
R227	1-216-049-00	METAL CHIP	1K	5%	1/10W
R228	1-216-842-11	METAL CHIP	56K	5%	1/16W
R229	1-216-821-11	METAL CHIP	1K	5%	1/16W
R230	1-216-838-11	METAL CHIP	27K	5%	1/16W
R231	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R232	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R233	1-216-821-11	METAL CHIP	1K	5%	1/16W
R234	1-216-821-11	METAL CHIP	1K	5%	1/16W
R235	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R236	1-216-821-11	METAL CHIP	1K	5%	1/16W
R237	1-216-821-11	METAL CHIP	1K	5%	1/16W
R239	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R242	1-216-864-11	METAL CHIP	0		
R244	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R245	1-216-833-11	METAL CHIP	10K	5%	1/16W
R246	1-216-833-11	METAL CHIP	10K	5%	1/16W
R247	1-216-833-11	METAL CHIP	10K	5%	1/16W
R248	1-216-841-11	METAL CHIP	47K	5%	1/16W
R249	1-216-821-11	METAL CHIP	1K	5%	1/16W
R250	1-216-821-11	METAL CHIP	1K	5%	1/16W
R251	1-216-845-11	METAL CHIP	100K	5%	1/16W
R252	1-216-853-11	METAL CHIP	470K	5%	1/16W
R255	1-216-833-11	METAL CHIP	10K	5%	1/16W
R256	1-216-833-11	METAL CHIP	10K	5%	1/16W
R257	1-216-821-11	METAL CHIP	1K	5%	1/16W
R258	1-216-821-11	METAL CHIP	1K	5%	1/16W
R259	1-216-833-11	METAL CHIP	10K	5%	1/16W
R260	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R261	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R262	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R263	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R265	1-216-643-11	METAL CHIP	470	0.5%	1/10W
R267	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R268	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W
R269	1-218-688-11	METAL CHIP	680	0.50%	1/16W
R270	1-218-706-11	METAL CHIP	3.9K	0.50%	1/16W
R272	1-216-817-11	METAL CHIP	470	5%	1/16W
R273	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W
R274	1-218-704-11	METAL CHIP	3.3K	0.50%	1/16W
R276	1-216-820-11	METAL CHIP	820	5%	1/16W
R278	1-216-820-11	METAL CHIP	820	5%	1/16W
R280	1-216-841-11	METAL CHIP	47K	5%	1/16W
R281	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R282	1-216-833-11	METAL CHIP	10K	5%	1/16W
R283	1-216-833-11	METAL CHIP	10K	5%	1/16W
R284	1-216-864-11	METAL CHIP	0		
R285	1-216-821-11	METAL CHIP	1K	5%	1/16W
R286	1-216-811-11	METAL CHIP	150	5%	1/16W
R287	1-216-813-11	METAL CHIP	220	5%	1/16W
R288	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R290	1-216-815-11	METAL CHIP	330	5%	1/16W
R291	1-216-815-11	METAL CHIP	330	5%	1/16W
R292	1-216-820-11	METAL CHIP	820	5%	1/16W
R293	1-216-864-11	METAL CHIP	0		
R294	1-216-839-11	METAL CHIP	33K	5%	1/16W
R296	1-216-821-11	METAL CHIP	1K	5%	1/16W
R297	1-216-841-11	METAL CHIP	47K	5%	1/16W
R298	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R300	1-216-864-11	METAL CHIP	0		
R301	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R302	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R303	1-216-834-11	METAL CHIP	12K	5%	1/16W
R304	1-216-838-11	METAL CHIP	27K	5%	1/16W
R305	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R308	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R309	1-216-829-11	METAL CHIP	4.7K	5%	1/16W

VA-67

Ref. No.	Part No.	Description			Remark
R310	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R311	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R312	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R314	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R315	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R316	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R318	1-216-809-11	METAL CHIP	100	5%	1/16W
R319	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R321	1-216-864-11	METAL CHIP	0		
R322	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R323	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R324	1-216-809-11	METAL CHIP	100	5%	1/16W
R325	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R326	1-216-821-11	METAL CHIP	1K	5%	1/16W
R331	1-216-864-11	METAL CHIP	0		
R332	1-216-817-11	METAL CHIP	470	5%	1/16W
R333	1-216-833-11	METAL CHIP	10K	5%	1/16W
R334	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R335	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R339	1-216-837-11	METAL CHIP	22K	5%	1/16W
R341	1-216-837-11	METAL CHIP	22K	5%	1/16W
R342	1-216-833-11	METAL CHIP	10K	5%	1/16W
R343	1-216-837-11	METAL CHIP	22K	5%	1/16W
R346	1-216-815-11	METAL CHIP	330	5%	1/16W
R347	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R348	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R350	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R351	1-216-845-11	METAL CHIP	100K	5%	1/16W
R352	1-216-845-11	METAL CHIP	100K	5%	1/16W
R353	1-216-845-11	METAL CHIP	100K	5%	1/16W
R354	1-216-864-11	METAL CHIP	0		
R355	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R356	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R357	1-216-845-11	METAL CHIP	100K	5%	1/16W
R358	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R359	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R360	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R361	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R362	1-216-833-11	METAL CHIP	10K	5%	1/16W
R364	1-216-821-11	METAL CHIP	1K	5%	1/16W
R365	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R366	1-216-817-11	METAL CHIP	470	5%	1/16W
R367	1-216-833-11	METAL CHIP	10K	5%	1/16W
R368	1-216-821-11	METAL CHIP	1K	5%	1/16W
R369	1-216-839-11	METAL CHIP	33K	5%	1/16W
R370	1-216-821-11	METAL CHIP	1K	5%	1/16W
R371	1-216-821-11	METAL CHIP	1K	5%	1/16W
R372	1-216-821-11	METAL CHIP	1K	5%	1/16W
R373	1-216-825-11	METAL CHIP	2.2K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R374	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R375	1-216-839-11	METAL CHIP	33K	5%	1/16W
R376	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R389	1-216-190-00	METAL GLAZE	470	5%	1/8W
R390	1-216-839-11	METAL CHIP	33K	5%	1/16W
R391	1-216-837-11	METAL CHIP	22K	5%	1/16W
R392	1-216-837-11	METAL CHIP	22K	5%	1/16W
R393	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R394	1-216-833-11	METAL CHIP	10K	5%	1/16W
R395	1-216-833-11	METAL CHIP	10K	5%	1/16W
R396	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R397	1-216-841-11	METAL CHIP	47K	5%	1/16W
R398	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R400	1-216-864-11	METAL CHIP	0		(AEP/UK)
R405	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R407	1-216-841-11	METAL CHIP	47K	5%	1/16W
R408	1-216-837-11	METAL CHIP	22K	5%	1/16W
R409	1-216-843-11	METAL CHIP	68K	5%	1/16W
R412	1-216-833-11	METAL CHIP	10K	5%	1/16W
R413	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R415	1-216-837-11	METAL CHIP	22K	5%	1/16W
R416	1-216-859-11	METAL GLAZE	1.5M	5%	1/16W
R418	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R419	1-216-821-11	METAL CHIP	1K	5%	1/16W
R420	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R421	1-216-864-11	METAL CHIP	0		
R423	1-216-864-11	METAL CHIP	0		
R426	1-216-817-11	METAL CHIP	470	5%	1/16W
R427	1-216-807-11	METAL CHIP	68	5%	1/16W
R428	1-216-817-11	METAL CHIP	470	5%	1/16W
R429	1-216-839-11	METAL CHIP	33K	5%	1/16W
R430	1-216-833-11	METAL CHIP	10K	5%	1/16W
R432	1-216-864-11	METAL CHIP	0		
R433	1-216-864-11	METAL CHIP	0		
R434	1-216-836-11	METAL CHIP	18K	5%	1/16W (E)
R435	1-216-841-11	METAL CHIP	47K	5%	1/16W (E)
R459	1-216-864-11	METAL CHIP	0		
R466	1-216-841-11	METAL CHIP	47K	5%	1/16W
R483	1-216-864-11	METAL CHIP	0		
R485	1-216-864-11	METAL CHIP	0		
R486	1-216-841-11	METAL CHIP	47K	5%	1/16W
R490	1-216-864-11	METAL CHIP	0		
R491	1-216-841-11	METAL CHIP	47K	5%	1/16W
R602	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R602	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R606	1-216-864-11	METAL CHIP	0		
R607	1-216-864-11	METAL CHIP	0		
R608	1-216-833-11	METAL CHIP	10K	5%	1/16W
R621	1-216-864-11	METAL CHIP	0		

Ref. No.	Part No.	Description			Remark
R624	1-216-864-11	METAL CHIP	0		
R630	1-216-864-11	METAL CHIP	0		
R636	1-216-821-11	METAL CHIP	1K	5%	1/16W

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description
RV101	1-238-087-11	RES, ADJ CERMET 1K
RV201	1-238-091-11	RES, ADJ CERMET 22K
RV202	1-238-087-11	RES, ADJ CERMET 1K
RV203	1-238-088-11	RES, ADJ, CERMET 2.2K
RV204	1-238-087-11	RES, ADJ CERMET 1K
RV205	1-238-091-11	RES, ADJ CERMET 22K
RV206	1-238-088-11	RES, ADJ, CERMET 2.2K
RV207	1-238-089-11	RES, ADJ CERMET 4.7K
RV210	1-238-088-11	RES, ADJ, CERMET 2.2K
RV211	1-238-092-11	RES, ADJ CERMET 47K
RV301	1-238-086-11	RES, ADJ CERMET 470
RV351	1-238-090-11	RES, ADJ CERMET 10K
RV353	1-238-087-11	RES, ADJ CERMET 1K
RV400	1-238-090-11	RES, ADJ CERMET 10K
RV401	1-238-090-11	RES, ADJ CERMET 10K

< SWITCH >

Ref. No.	Part No.	Description
S201	1-572-275-11	SWITCH, SLIDE (IN/OUT) (E)

< THERMISTOR >

Ref. No.	Part No.	Description
TH001	1-809-357-21	THERMISTOR

< FLEXIBLE BOARD >

Ref. No.	Part No.	Description
W702	1-633-976-11	FP-251 FLEXIBLE BOARD

< CRYSTAL >

Ref. No.	Part No.	Description
X301	1-577-117-21	VIBRATOR, CRYSTAL (4.433619MHz)

****

* A-7062-745-A VC-99 BOARD, COMPLETE
****
(Ref.No 1,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C302	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C401	1-164-634-11	CERAMIC CHIP	1uF		16V
C402	1-164-634-11	CERAMIC CHIP	1uF		16V
C403	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C404	1-164-634-11	CERAMIC CHIP	1uF		16V
C406	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C407	1-164-634-11	CERAMIC CHIP	1uF		16V
C408	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C409	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C410	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C411	1-124-566-11	ELECT	120uF	20%	6.3V
C412	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C413	1-164-634-11	CERAMIC CHIP	1uF		16V
C414	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C415	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C416	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C417	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C419	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C501	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C502	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C503	1-164-634-11	CERAMIC CHIP	1uF		16V
C504	1-128-292-11	ELECT	220uF	20%	10V
C506	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C507	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C508	1-135-072-21	TANTALUM CHIP	0.22uF	10%	35V
C509	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C510	1-128-004-11	ELECT CHIP	10uF	20%	16V
C511	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C512	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C513	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C514	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C517	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C518	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C519	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C520	1-135-071-21	TANTALUM CHIP	0.15uF	10%	35V
C521	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C651	1-126-217-11	ELECT CHIP	15uF	20%	10V
C654	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C655	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C656	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C657	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C658	1-128-004-11	ELECT CHIP	10uF	20%	16V
C659	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C660	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C661	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C662	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C663	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C664	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C665	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C666	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C667	1-164-156-11	CERAMIC CHIP	0.1uF		25V

< CONNECTOR >

Ref. No.	Part No.	Description
CN301	1-568-338-11	CONNECTOR, BOARD TO BOARD 24P
CN302	1-568-331-11	CONNECTOR, BOARD TO BOARD 10P
CN303	1-566-534-11	CONNECTOR, FPC (ZIF) 18P
CN304	1-565-877-11	PIN, CONNECTOR (PC BOARD) 5P
CN305	1-566-528-21	CONNECTOR, FPC (ZIF) 12P

VC-99

Ref. No.	Part No.	Description	Remark
CN306	1-565-528-21	PIN, CONNECTOR (PC BOARD) 3P	
CN307	* 1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P	
CN308	* 1-565-541-11	PIN, CONNECTOR (PC BOARD) 2P	
CN651	* 1-566-187-11	PIN, CONNECTOR (PC BOARD) 8P	
CN652	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P	
CN653	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P	
CN654	* 1-565-529-21	PIN, CONNECTOR (PC BOARD) 4P	
CN655	1-565-530-11	PIN, CONNECTOR (PC BOARD) 5P	

< DIODE >

Ref. No.	Part No.	Description	Remark
D501	8-719-404-46	DIODE MA110	
D502	8-719-404-46	DIODE MA110	
D503	8-719-404-46	DIODE MA110	
D504	8-719-404-46	DIODE MA110	
D600	8-719-420-90	DIODE MA8051-M	

< FILTER >

Ref. No.	Part No.	Description	Remark
FL301	1-236-759-21	FILTER, LOW PASS (TRAP)	
FL302	1-415-731-21	DELAY LINE, LC (YH)	
FL303	1-415-819-11	DELAY LINE, LC	
FL401	1-415-730-21	DELAY LINE, LC (100NS)	

< HIC >

Ref. No.	Part No.	Description	Remark
HIC301	A-7068-186-A	HIC MX-10 BOARD, COMPLETE	

< IC >

Ref. No.	Part No.	Description	Remark
IC301	8-759-946-00	IC MB88341PFV	
IC401	8-752-038-XX	IC CXA1392R	
IC501	8-759-038-86	IC MC68HC11E9FU-SC400225	
IC502	8-759-008-95	IC MC14028BF	
IC504	8-759-635-27	IC M62352GP	
IC505	8-759-998-96	IC LM324D	
IC507	8-759-030-74	IC SC14S66F	
IC508	8-759-937-56	IC S-8054ALB-S	
IC509	8-759-509-05	IC XRU4066BF	
IC510	8-759-998-96	IC LM324D	
IC651	8-759-981-82	IC RC3414M	
IC652	8-759-037-20	IC MPC1737M	
IC653	8-759-998-98	IC LM358D	
IC656	8-759-998-96	IC LM324D	

< COIL >

Ref. No.	Part No.	Description	Remark
L401	1-410-391-11	INDUCTOR, CHIP 68uH	
L502	1-412-058-11	INDUCTOR, CHIP 10uH	
L503	1-412-062-11	INDUCTOR, CHIP 47uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q301	8-729-905-23	TRANSISTOR 2SA1576-R	
Q302	8-729-905-23	TRANSISTOR 2SA1576-R	
Q303	8-729-402-84	TRANSISTOR XN4601	
Q401	8-729-402-84	TRANSISTOR XN4601	
Q402	8-729-402-84	TRANSISTOR XN4601	
Q403	8-729-905-23	TRANSISTOR 2SA1576-R	
Q404	8-729-905-35	TRANSISTOR 2SC4081-R	
Q502	8-729-420-50	TRANSISTOR UN5215	
Q504	8-729-403-10	TRANSISTOR XN6215	
Q505	8-729-403-10	TRANSISTOR XN6215	
Q506	8-729-420-07	TRANSISTOR XN6213	
Q507	8-729-420-50	TRANSISTOR UN5215	
Q508	8-729-402-78	TRANSISTOR XN6401	
Q509	8-729-403-10	TRANSISTOR XN6215	
Q510	8-729-905-35	TRANSISTOR 2SC4081-R	
Q513	8-729-402-84	TRANSISTOR XN4601	
Q514	8-729-905-35	TRANSISTOR 2SC4081-R	
Q515	8-729-402-84	TRANSISTOR XN4601	
Q516	8-729-905-35	TRANSISTOR 2SC4081-R	
Q651	8-729-905-23	TRANSISTOR 2SA1576-R	
Q653	8-729-106-60	TRANSISTOR 2SB1115A	
Q654	8-729-905-35	TRANSISTOR 2SC4081-R	
Q655	8-729-905-35	TRANSISTOR 2SC4081-R	
Q656	8-729-905-35	TRANSISTOR 2SC4081-R	
Q657	8-729-402-84	TRANSISTOR XN4601	
Q658	8-729-402-84	TRANSISTOR XN4601	
Q659	8-729-821-88	TRANSISTOR 2SK1332-3	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R302	1-216-820-11	METAL CHIP 820 5% 1/16W	
R304	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R307	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R310	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R311	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R312	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R313	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R314	1-216-864-11	METAL CHIP 0	
R316	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R317	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R318	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R321	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R322	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R325	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R328	1-216-864-11	METAL CHIP 0	
R329	1-216-864-11	METAL CHIP 0	
R402	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R406	1-216-864-11	METAL CHIP 0	
R407	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R410	1-216-864-11	METAL CHIP 0	
R414	1-216-864-11	METAL CHIP 0	

Ref. No.	Part No.	Description			Remark
R415	1-216-820-11	METAL CHIP	820	5%	1/16W
R416	1-216-817-11	METAL CHIP	470	5%	1/16W
R417	1-216-833-11	METAL CHIP	10K	5%	1/16W
R418	1-216-833-11	METAL CHIP	10K	5%	1/16W
R419	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R420	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R421	1-216-821-11	METAL CHIP	1K	5%	1/16W
R422	1-216-837-11	METAL CHIP	22K	5%	1/16W
R427	1-216-841-11	METAL CHIP	47K	5%	1/16W
R428	1-216-835-11	METAL CHIP	15K	5%	1/16W
R429	1-216-839-11	METAL CHIP	33K	5%	1/16W
R432	1-216-839-11	METAL CHIP	33K	5%	1/16W
R435	1-216-833-11	METAL CHIP	10K	5%	1/16W
R437	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R440	1-216-864-11	METAL CHIP	0		
R501	1-216-837-11	METAL CHIP	22K	5%	1/16W
R502	1-216-837-11	METAL CHIP	22K	5%	1/16W
R503	1-216-833-11	METAL CHIP	10K	5%	1/16W
R504	1-216-833-11	METAL CHIP	10K	5%	1/16W
R505	1-216-841-11	METAL CHIP	47K	5%	1/16W
R508	1-216-833-11	METAL CHIP	10K	5%	1/16W
R509	1-216-833-11	METAL CHIP	10K	5%	1/16W
R510	1-216-833-11	METAL CHIP	10K	5%	1/16W
R511	1-216-833-11	METAL CHIP	10K	5%	1/16W
R513	1-216-845-11	METAL CHIP	100K	5%	1/16W
R514	1-216-833-11	METAL CHIP	10K	5%	1/16W
R515	1-216-857-11	METAL CHIP	1M	5%	1/16W
R517	1-216-833-11	METAL CHIP	10K	5%	1/16W
R518	1-216-833-11	METAL CHIP	10K	5%	1/16W
R519	1-216-833-11	METAL CHIP	10K	5%	1/16W
R521	1-216-833-11	METAL CHIP	10K	5%	1/16W
R522	1-216-833-11	METAL CHIP	10K	5%	1/16W
R523	1-216-840-11	METAL CHIP	39K	5%	1/16W
R524	1-216-833-11	METAL CHIP	10K	5%	1/16W
R525	1-216-833-11	METAL CHIP	10K	5%	1/16W
R526	1-216-847-11	METAL CHIP	150K	5%	1/16W
R527	1-216-845-11	METAL CHIP	100K	5%	1/16W
R528	1-216-833-11	METAL CHIP	10K	5%	1/16W
R529	1-216-845-11	METAL CHIP	100K	5%	1/16W
R530	1-216-845-11	METAL CHIP	100K	5%	1/16W
R531	1-216-833-11	METAL CHIP	10K	5%	1/16W
R532	1-216-833-11	METAL CHIP	10K	5%	1/16W
R533	1-216-833-11	METAL CHIP	10K	5%	1/16W
R534	1-216-837-11	METAL CHIP	22K	5%	1/16W
R535	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R536	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R537	1-216-845-11	METAL CHIP	100K	5%	1/16W
R546	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R547	1-216-829-11	METAL CHIP	4.7K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R550	1-216-833-11	METAL CHIP	10K	5%	1/16W
R551	1-216-833-11	METAL CHIP	10K	5%	1/16W
R552	1-216-833-11	METAL CHIP	10K	5%	1/16W
R553	1-216-685-11	METAL CHIP	27K	0.5%	1/10W
R554	1-216-842-11	METAL CHIP	56K	5%	1/16W
R555	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R556	1-216-833-11	METAL CHIP	10K	5%	1/16W
R557	1-216-844-11	METAL CHIP	82K	5%	1/16W
R560	1-216-833-11	METAL CHIP	10K	5%	1/16W
R562	1-216-833-11	METAL CHIP	10K	5%	1/16W
R645	1-216-839-11	METAL CHIP	33K	5%	1/16W
R646	1-216-841-11	METAL CHIP	47K	5%	1/16W
R647	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R648	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R649	1-216-309-00	METAL CHIP	5.6	5%	1/10W
R650	1-216-833-11	METAL CHIP	10K	5%	1/16W
R652	1-216-835-11	METAL CHIP	15K	5%	1/16W
R653	1-216-835-11	METAL CHIP	15K	5%	1/16W
R654	1-216-843-11	METAL CHIP	68K	5%	1/16W
R655	1-216-834-11	METAL CHIP	12K	5%	1/16W
R656	1-216-134-00	METAL CHIP	2.2	5%	1/8W
R659	1-216-821-11	METAL CHIP	1K	5%	1/16W
R660	1-216-836-11	METAL CHIP	18K	5%	1/16W
R661	1-216-821-11	METAL CHIP	1K	5%	1/16W
R662	1-216-815-11	METAL CHIP	330	5%	1/16W
R664	1-216-821-11	METAL CHIP	1K	5%	1/16W
R665	1-216-821-11	METAL CHIP	1K	5%	1/16W
R666	1-216-839-11	METAL CHIP	33K	5%	1/16W
R667	1-216-839-11	METAL CHIP	33K	5%	1/16W
R668	1-216-833-11	METAL CHIP	10K	5%	1/16W
R669	1-216-841-11	METAL CHIP	47K	5%	1/16W
R670	1-216-807-11	METAL CHIP	68	5%	1/16W
R671	1-216-848-11	METAL CHIP	180K	5%	1/16W
R672	1-216-848-11	METAL CHIP	180K	5%	1/16W
R673	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R674	1-216-840-11	METAL CHIP	39K	5%	1/16W
R675	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R676	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R677	1-216-844-11	METAL CHIP	82K	5%	1/16W
R679	1-216-837-11	METAL CHIP	22K	5%	1/16W
R680	1-216-833-11	METAL CHIP	10K	5%	1/16W
R681	1-216-817-11	METAL CHIP	470	5%	1/16W
R682	1-216-833-11	METAL CHIP	10K	5%	1/16W
R683	1-216-857-11	METAL CHIP	1M	5%	1/16W
R684	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R685	1-216-848-11	METAL CHIP	180K	5%	1/16W
R686	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R687	1-216-833-11	METAL CHIP	10K	5%	1/16W
R688	1-216-841-11	METAL CHIP	47K	5%	1/16W

Ref. No.	Part No.	Description	Remark
R689	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R690	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R694	1-216-848-11	METAL CHIP 180K 5% 1/16W	
R698	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R699	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R700	1-216-855-11	METAL CHIP 680K 5% 1/16W	
R702	1-216-681-11	METAL CHIP 18K 0.5% 1/10W	
R703	1-216-677-11	METAL CHIP 12K 0.5% 1/10W	
		< CRYSTAL >	
X501	1-578-689-21	VIBRATOR (8MHz)	

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* A-7062-278-A VF-26 BOARD, COMPLETE

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(Ref. No 6,000 Series)

Ref. No.	Part No.	Description	Remark
		< CAPACITOR >	
C901	1-126-369-11	ELECT 220uF 20% 6.3V	
C902	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C904	1-127-515-11	ELECT(SOLID) 47uF 20% 6.3V	
C905	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C906	1-163-115-00	CERAMIC CHIP 82PF 5% 50V	
C907	⚠ 1-162-625-11	CERAMIC CHIP 0.0047uF 5% 50V	
C908	⚠ 1-164-182-11	CERAMIC CHIP 0.0033uF 10% 50V	
C909	1-126-193-11	ELECT 1uF 20% 50V	
C911	1-131-388-00	TANTALUM 68uF 10% 6.3V	
C912	1-102-038-00	CERAMIC 0.001uF	
C913	1-163-033-00	CERAMIC CHIP 0.022uF 50V	
C915	1-126-193-11	ELECT 1uF 20% 50V	
C916	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	(TYPE 1)
C916	1-163-145-00	CERAMIC CHIP 0.0015uF 5% 50V	(TYPE 2)
C917	1-135-162-21	TANTALUM CHIP 33uF 20% 6.3V	(TYPE 2)
C917	1-135-166-21	TANTALUM CHIP 47uF 10% 10V	(TYPE 1)
C918	1-162-638-11	CERAMIC CHIP 1uF 16V	
C919	1-135-070-00	TANTALUM CHIP 0.1uF 10% 35V	
C920	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
		< CONNECTOR >	
CN901	* 1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
CN902	* 1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
CN904	1-575-570-21	CONNECTOR, FPC/FFC 6P	
		< CONPOSITION CIRCUIT BLOCK >	
CP901	1-238-119-11	RES, ADJ	
		< SOCKET >	
CRT901	1-526-978-21	SOCKET ASSY, CRT	
		< DIODE >	
D670	8-719-404-46	DIODE MA110	
D903	8-719-400-20	DIODE MA152WA	
D955	8-719-404-19	DIODE LN1251C	
		< IC >	
IC901	8-759-420-01	IC AN2512S	(TYPE 1)
IC901	8-759-511-01	IC BA7147F	(TYPE 2)
		< COIL >	
L901	1-410-645-31	INDUCTOR 100uH	
L902	1-410-385-11	INDUCTOR CHIP 22uH	
L903	⚠ 1-459-858-11	COIL, FERRITE (HLC)	
		< TRANSISTOR >	
Q903	8-729-106-68	TRANSISTOR 2SD1615	
Q904	8-729-216-31	TRANSISTOR 2SA1163G	
		< RESISTOR >	
R902	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	(TYPE 1)
R903	1-216-041-00	METAL CHIP 470 5% 1/10W	
R907	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R908	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R909	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R911	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R914	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R915	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R916	1-216-125-00	METAL CHIP 1.5M 5% 1/10W	
R917	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R919	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R920	1-216-111-00	METAL CHIP 390K 5% 1/10W	(TYPE 2)
R920	1-216-113-00	METAL CHIP 470K 5% 1/10W	(TYPE 1)
R921	1-216-011-00	METAL CHIP 27 5% 1/10W	(TYPE 2)
R921	1-216-013-00	METAL CHIP 33 5% 1/10W	(TYPE 1)
R922	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R923	1-216-025-00	METAL CHIP 100 5% 1/10W	
R924	1-216-306-11	METAL CHIP 3.9 5% 1/10W	
R925	1-216-334-11	METAL GLAZE 22K 1% 1/10W	(TYPE 2)
R925	1-216-336-11	METAL CHIP 47K 1% 1/10W	(TYPE 1)
R926	1-216-107-00	METAL CHIP 270K 5% 1/10W	(TYPE 1)
R926	1-218-165-11	METAL GLAZE 220K 1% 1/10W	(TYPE 2)
R928	1-216-870-11	METAL CHIP 180K 1% 1/10W	
R929	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	(TYPE 1)
R929	1-216-073-00	METAL CHIP 10K 5% 1/10W	(TYPE 2)
R930	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R931	1-216-121-00	METAL CHIP 1M 5% 1/10W	(TYPE 1)
R950	1-216-041-00	METAL CHIP 470 5% 1/10W	
R951	1-216-295-00	METAL CHIP 0 5% 1/10W	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
		< VARIABLE RESISTOR >	
RV901	1-238-647-11	RES, ADJ, METAL GLAZE 4.7M	
		< TRANSFORMER >	
T901	⚠· 1-439-428-11	TRANSFORMER ASSY, FLYBACK	
		< THERMISTOR >	
TH901	1-807-938-11	THERMISTOR	

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* A-7062-279-A VF-27 BOARD, COMPLETE

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(Ref.No 7,000 Series)

Ref. No.	Part No.	Description	Remark
		< CAPACITOR >	
C901	1-124-442-00	ELECT 330uF 20% 6.3V	
C903	1-163-077-00	CERAMIC CHIP 0.1uF 10% 25V	
C904	1-126-160-11	ELECT 1uF 20% 50V	
C905	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C906	1-131-381-00	TANTALUM 47uF 10% 10V	
C907	1-162-638-11	CERAMIC CHIP 1uF 16V	
C908	1-136-165-00	FILM 0.1uF 5% 50V	
C909	1-163-109-00	CERAMIC CHIP 47PF 5% 50V	
C910	1-124-587-11	ELECT 220uF 20% 6.3V	
C911	1-163-141-00	CERAMIC CHIP 0.001uF 5% 50V	
C912	⚠· 1-162-625-11	CERAMIC CHIP 0.0047uF 5% 50V	
C913	⚠· 1-162-625-11	CERAMIC CHIP 0.0047uF 5% 50V	
C914	⚠· 1-163-209-00	CERAMIC CHIP 0.0015uF 5% 50V	
C915	1-126-090-11	ELECT 82uF 20% 10V	
C916	1-126-163-11	ELECT 4.7uF 20% 50V	
C918	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C919	1-102-038-00	CERAMIC 0.001uF	
		< CONNECTOR >	
CN902	* 1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
CN903	* 1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
CN904	1-575-570-21	CONNECTOR, FPC/FFC 6P	
		< DIODE >	
D903	8-719-400-20	DIODE MA152WA	
D955	8-719-404-19	DIODE LN1251C	
		< IC >	
IC901	8-759-420-01	IC AN2512S	
		< COIL >	
L901	1-410-831-21	INDUCTOR 82uH	
L902	1-408-977-21	INDUCTOR 39uH	
L903	⚠· 1-459-858-11	COIL, FERRITE (HLC)	
		< TRANSISTOR >	
Q903	8-729-216-31	TRANSISTOR 2SA1163	
Q904	8-729-100-66	TRANSISTOR 2SC1623	
Q905	8-729-106-68	TRANSISTOR 2SD1615	
		< RESISTOR >	
R903	1-216-041-00	METAL CHIP 470 5% 1/10W	
R905	1-216-007-00	METAL CHIP 18 5% 1/10W	
R906	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R908	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R909	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R910	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R911	1-216-013-00	METAL CHIP 33 5% 1/10W	
R912	1-216-691-11	METAL CHIP 47K 0.5% 1/10W	
R913	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R914	1-216-025-00	METAL CHIP 100 5% 1/10W	
R915	1-216-306-11	METAL CHIP 3.9 5% 1/10W	
R917	1-216-045-00	METAL CHIP 680 5% 1/10W	
R918	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R919	1-216-748-11	METAL CHIP 39K 5% 1/10W	
R920	1-216-748-11	METAL CHIP 39K 5% 1/10W	
R921	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R922	1-216-101-00	METAL CHIP 150K 5% 1/10W	
R923	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R924	1-216-131-11	METAL CHIP 2.7M 5% 1/10W	
R925	1-216-131-11	METAL CHIP 2.7M 5% 1/10W	
R926	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R928	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R933	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R950	1-216-041-00	METAL CHIP 470 5% 1/10W	
		< VARIABLE RESISTOR >	
RV901	1-230-873-11	RES, ADJ, METAL 47K	
RV902	1-230-866-11	RES, ADJ, METAL 470	
RV903	1-230-869-11	RES, ADJ, METAL 4.7K	
RV904	1-228-762-00	RES, ADJ, METAL GLAZE 1M	
		< TRANSFORMER >	
T901	⚠· 1-439-431-11	TRANSFORMER ASSY, FLYBACK	
		< THERMISTOR >	
TH901	1-807-938-11	THERMISTOR	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

VF-27 VK-14

Ref. No.	Part No.	Description	Remark
		< SOCKET >	
W901	1-540-019-21	SOCKET ASSY, CRT	

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Ref. No.	Part No.	Description	Remark
	* A-7071-381-A	VK-14 BOARD, COMPLETE (AEP/UK) *********************	
	* A-7071-444-A	VK-14 BOARD, COMPLETE (E) *********************	
		(Ref.No 5,000 Series)	
		< DIODE >	
D508	8-719-420-33	DIODE MA151K	
D509	8-719-940-45	DIODE DWA010	
D523	8-719-977-34	DIODE DTZ12	
D524	8-719-977-34	DIODE DTZ12	
D526	8-719-977-34	DIODE DTZ12	
D527	8-719-977-34	DIODE DTZ12	
D530	8-719-404-46	DIODE MA110	
		< RESISTOR >	
R502	1-216-029-00	METAL CHIP 150 5% 1/10W	
		< SWITCH >	
S500	1-571-787-11	SWITCH, TACTILE (REW)	
S503	1-571-787-11	SWITCH, TACTILE (FF)	
S504	1-571-787-11	SWITCH, TACTILE (STOP)	
S505	1-571-787-11	SWITCH, TACTILE (PAUSE)	
S506	1-571-787-11	SWITCH, TACTILE (TIME (NEXT))	
S507	1-571-787-11	SWITCH, TACTILE (DATE (+))	
S508	1-571-787-11	SWITCH, TACTILE (DATA SCREEN)	
S509	1-571-787-11	SWITCH, TACTILE (AGE/EVENT)	
S510	1-572-284-11	SWITCH, SLIDE (REC) (E)	
S511	1-570-870-11	SWITCH, SLIDE (REC MODE, EDIT)	
S512	1-571-787-11	SWITCH, TACTIL (FRAME)	
S513	1-571-787-11	SWITCH, TACTILE (SLOW)	
S514	1-572-283-11	SWITCH, SLIDE (POWER)	
S515	1-571-787-11	SWITCH, TACTILE (ZERO MEM)	
S516	1-571-787-11	SWITCH, TACTILE (COUNTER RESET)	
S520	1-571-787-11	SWITCH, TACTILE (PB)	
S521	1-570-870-11	SWITCH, SLIDE (BEEP)	
		< FLEXIBLE BOARD >	
W550	1-633-983-11	FP-296 FLEXIBLE BOARD	
W551	1-633-980-11	FP-308 FLEXIBLE BOARD	

****

Ref. No.	Part No.	Description	Remark
		MISCELLANEOUS *************	
	1-569-286-11	CONNECTOR, CARD EDGE 5P (on the FP-249)	
71	1-542-125-21	MICROPHONE (C-2027)	
163	1-808-505-12	SENSOR (DEW)	
318	8-741-509-51	IC SBX1509-51 (HIC RP-77 BOARD, COMPLETE)	
322	1-569-347-11	CONNECTOR, FPC (TRANSLATION) 13P	
353	1-547-381-12	FILTER BLOCK, OPTICAL	
364 ⚠	1-466-230-21	CONVERTER UNIT, D/D	
401	1-547-422-11	LENS, ZOOM (VCL-8508XE)	
451	1-547-412-15	LENS, ZOOM (VCL-8508XF)	
BZ901	1-529-096-12	BUZZER, PIEZOELECTRIC	
IC101	8-752-604-72	IC ICX039AN-2 (CCD IMAGER) (Note 1)	
L901 ⚠	1-451-310-21	DEFLECTION YOKE (B/W) (B TYPE)	
M902	8-835-331-01	MOTOR, DC U-22A (CAPSTAN)	
M903	A-7040-208-A	MOTOR ASSY, THREADING (LOADING)	
S901	1-572-286-11	SWITCH, PUSH	
S903	1-571-099-11	SWITCH	
V901-1⚠	1-546-085-11	CATHODE-RAY TUBE, B/W (B TYPE)	
V901-2⚠	1-452-482-11	CRT ASSY (M91JYZ60WB) (A TYPE)	

****

Ref. No.	Part No.	Description	Remark
		ACCESSORY & PACKING MATERIAL ***************************	
	A-6767-706-A	RFU ADAPTOR (RFU-89EA) (E)	
	A-6767-707-A	RFU ADAPTOR (RFU-89EA) (UK)	
	A-6768-254-A	RFU ADAPTOR (RFU-90E) (AEP)	
	1-465-395-41	COMMANDER, REMOTE (RMT-502) (E)	
	1-465-395-81	COMMANDER, REMOTE (RMT-502) (AEP/UK)	
	1-571-164-11	SWITCH, ANTENNA CHANGE (CABLE) (UK/E)	
	* 3-340-514-01	BAG, PROTECTION	
	3-712-673-01	SCREWDRIVER (UK/E)	
	* 3-741-532-01	CUSHION, ACC	
	* 3-744-867-01	CUSHION (UPPER)	
	* 3-744-868-01	CUSHION (LOWER)	
	* 3-744-971-51	INDIVIDUAL CARTON	
	3-752-999-11	MANUAL, INSTRUCTION (ENGLISH) (AEP/UK)	
	3-752-999-41	MANUAL, INSTRUCTION (FRENCH/GERMAN/SPANISH) (AEP)	
	3-752-999-51	MANUAL, INSTRUCTION (DUTCH/SWEDISH/ITALIAN) (AEP)	
	3-753-494-11	MANUAL, INSTRUCTION (ENGLISH) (E)	
	3-753-494-41	MANUAL, INSTRUCTION (FRENCH/GERMAN/SPANISH) (E)	
	3-753-494-51	MANUAL, INSTRUCTION (ARABIC) (E)	
	3-753-494-61	MANUAL, INSTRUCTION (CHINESE) (E)	
	* 3-764-631-12	INSTRUCTION, DEW CONDENSATION (AEP/E)	
	3-941-737-01	BELT, SHOULDER	

Note 1) For replacement of CCD imager, CD-65 board, complete and DT-77 board, complete read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 93.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
**	AC-V60A	AC POWER ADPTOR	
***	NP-66	BATTERY PACK	

Note

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

****

HARDWARE LIST

****

# 1	7-621-281-15	SCREW +P 2X2
# 2	7-627-553-48	PRECISION SCREW +P 2X4 TYPE 3
# 3	7-627-553-68	SCREW, PRECISION +P 2X6 TYPE3
# 4	7-671-155-01	STEEL BALL 3.0
# 5	7-627-555-88	SCREW (M1.4X1.8)
# 6	7-627-553-37	SCREW (M2X3), SPECIAL HEAD

****

SECTION 7
SERVICE MODE

☆This unit adopts the camera adjustment and the EVR (Electronic Variable resistor) with the SENSER LANC system.

7-1. SENSER LANC

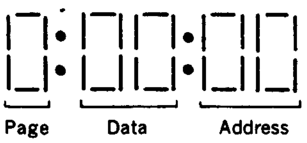
SENSER LANC is the LANC format to adjust the EVR (Electronic Variable resistor) of Video 8 Handycam and to perform tests by using the LANC (control L). This word stands for the same as the SERVICE LANC formerly used, however, the unified word "SENSER LANC" will be used with this substantial functions.

7-1-1. How to Use RM-95 jig (remote control for adjustment)

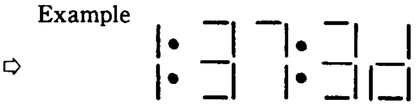
RM-95 jig is used to operate the SENSER LANC. HOLD switch of this jig is remodelled for service to get the SENSER LANC mode. Replacing microcomputer in RM-95 is required for the old-model RM-95 jig, which has no page display function.

Old model	μPD7503G-A71-12 μPD7503G-C23-12	8-759-142-56 8-759-146-77	Page is not displayed (Replacing microcomputer is required)
New model	μPD7503G-C56-12	8-759-148-35	Page is displayed

LCD display of RM-95



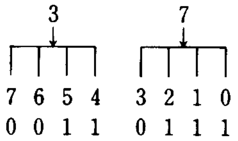
Example



This means that the page 1 and address 3D is data of 37.

- Reference between Data and Bit

When the data is 37 ⇨ Bit

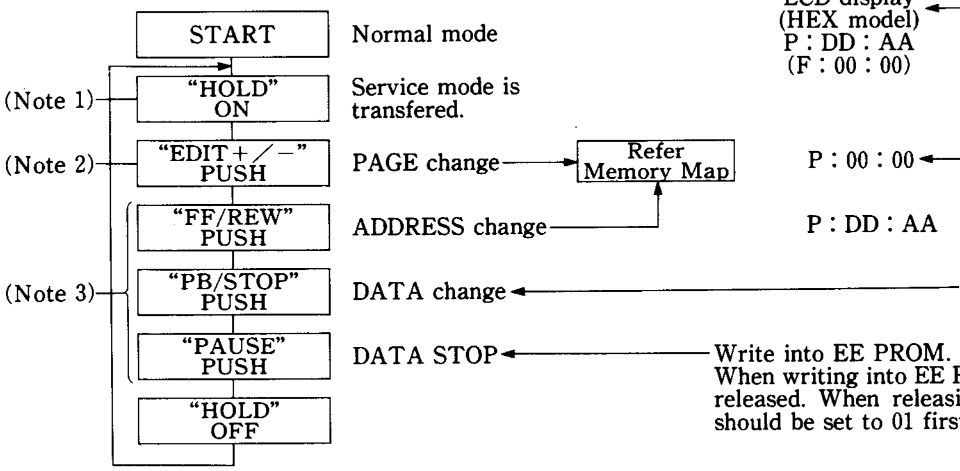


Page	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	3D	MP-HG		ME/MP	REC PROOF	V MUTE	A MUTE	JOG	VA PB MODE
		0	0	1	1	0	1	1	1

The data in the above list means as follows:

ME SW..............ON
REC PROOF SW ....ON
AUDIO MUTE ......ON
JOG..................ON
VA PB MODE........ON

7-1-2. Tansfer method of the service mode with RM-95


START
Normal mode
(Note 1)
"HOLD" ON
Service mode is transfered.
(Note 2)
"EDIT+/−" PUSH
PAGE change
Refer Memory Map
"FF/REW" PUSH
ADDRESS change
(Note 3)
"PB/STOP" PUSH
DATA change
"PAUSE" PUSH
DATA STOP
"HOLD" OFF

LCD display (HEX model)
P : DD : AA
(F : 00 : 00)

Data display
Set address data is displayed. The page input first from the normal condition is set to 0.

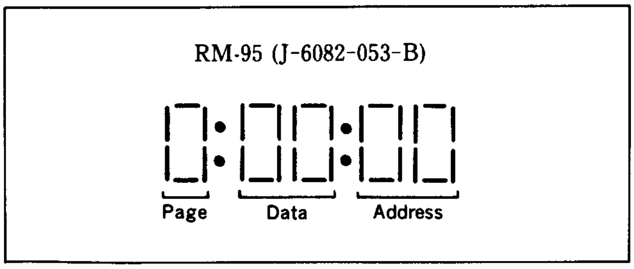
P : 00 : 00 When selecting the page not being built-in, the data value set previously becomes indefinite. When modifying in the built-in page, the address is not changed.

P : DD : AA

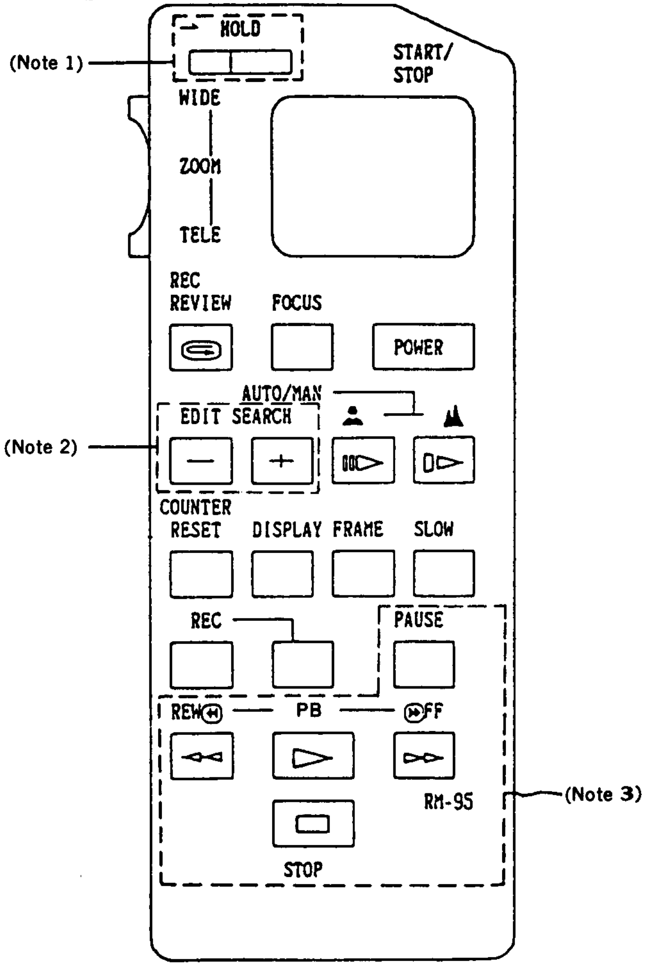
<When ADJ data is modified>
EVR value (RAM) is updated to the modified data. (It is not written into EE PROM)

Write into EE PROM.
When writing into EE PROM, WRITE PROTECT should be released. When releasing, data of page 1 and address 00 should be set to 01 first.

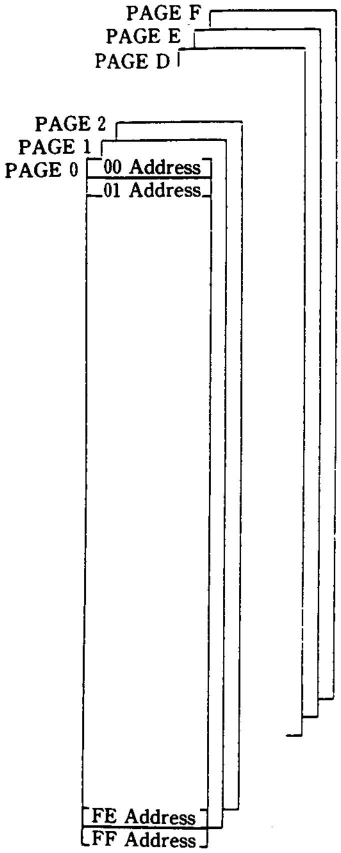
Command name	Command function	Function Button with RM-95
Page Up	Page+ 1	Edit Search+
Page Down	Page− 1	Edit Search−
Direct Page Set	Set to direct page	Event Clear
Address Up	Address+1	Fast Forward
Address Down	Address−1	Rewind
Data Up	Data+ 1	Play Back
Data Down	Data−1	Stop
Store	Write data into EEPROM, RAM	Pause


RM-95 (J-6082-053-B)
0:00:00
Page
Data
Address

RM-95 (J-6082-053-B)


(Note 1)
HOLD
START/ STOP
WIDE
ZOOM
TELE
REC REVIEW
FOCUS
POWER
AUTO/MAN
EDIT SEARCH
(Note 2)
−
+
COUNTER RESET
DISPLAY
FRAME
SLOW
REC
PAUSE
REW
PB
FF
RM-95
(Note 3)
STOP

7-1-3. SENSER LANC Memory Map



PAGE	Page allocation	Description
0	Service	
1	Mode Control RAM	RAM and I/O interface data memory area required for operating the mode controller. Data is not held when the power is turned off because this area is not ROM.
2	Mode Control I/O	
3	Mechanical Control RAM	RAM and I/O memory area of the mechanical controller.
4	Mode Control I/O	
5	Camera microcompuler RAM	RAM and I/O memory area of the camera micro controller.
6	Camera microcompuler I/O	
7	Spare	
8	Spare	
9	Spare	
A	Spare	
B	Spare	
C	Spare	
D	VTR EE-PROM	ROM memory area of the VTR part. Data of this area is held by EE-PROM when the power is tuned off. Releasing protect is required for changing data.
E	Camera EE-PROM2	ROM memory area of the camera part. Data of this area is held by EE•P•ROM when the power is tuned off.
F	Camera EE-PROM1	

Note) There are 16 types of page from 0~F. The allocation of page is as the above list. Only the memory of page D, E and F is not erased when the power is turned off as the EVR (Electronic Variable resistor).

7-1-4. Types of Self-diagnostic Feature

This unit has ADJUST mode and TEST mode as follows:

MODE		Contents
ADJUST	Camera adjustment	Refer to Camera Adjustment
	Switching position adjustment	Refer to each adjustment page
	Battery DOWN adjustment	
TEST	Pass adjustment track shift	When adjusting tape pass, set this mode and shift the tracking.
	Emergency STOP inhibition	Detection of emergency is inhibited. This allows the following items. • Power is not turned off when the battery is ended. • SP/LP is not automatically distinguished. • Emergency is not detected except for TOP/END detection of the TAPE.
	Read of emergency code	The following functions are added to the emergency display function currently in use. ①The lithium battery is not required because to memorize into EE-PROM is allowed. ②The first emergency and the last emergency are memorized. ③The mode when the emergency is generated is memorized, in addition to the emergency contents.
	Motor single check	Rotating in right direction, inverting, stopping of each motor can be separately controlled. • Drum motor • Capstan motor • Loading motor
	Function switch check	The acceptance of the function switch of the unit can be confirmed by designating an address. On the contrary, RM-95 can command the substitution for the function switch of the unit.
	Mechanical switch check	The contents of the mechanical switch and the mode switch can be confirmed.
	Sensor check	The following sensor is input by performing A/D selecting, and the A/D selecting value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction, DEW sensor
	Reception contents check of wireless remote control	The received code contents of the remote control code can be confirmed.

7-1-5. How to use practically

How to use :

How to set the adjustment mode and the TEST mode

Set RM-95 to the service mode. (HOLD SW "ON")

How to change and write data

Press the PAUSE button of RM-95. Pressing PAUSE button is not required for some RAM and I/O area.

Change and write data of EE-PROM

Removing PROTECT is required. The PROTECT is removed by setting as follows:

PAGE 1	Address 00	Data 01

But CAMERA system don't need release, because don't set PROTECT.

How to release each mode

Releasing from EE-PROM area	Be sure to return the data of PAGE 1 address 00 to 00 from 01, and then turn off the service mode of RM-95.
Releasing from RAM and I/O area	Turn off the service mode or turn off the power, because hoding of data is not required.

- In order to perform the pass track shift......Refer to page 195.
- In order to inhibit the emergency detection......Refer to the list in page 236.
- In order to check the emergency code......Refer to page 237.
- In order to operate the motor singly......Refer to page 240.
- In order to check the function switch......Refer to page 239.
- In order to check the mechanical switch......Refer to page 238.
- In order to read the A/D selecting value......Refer to page 240.
- In order to check the reception contents of the wireless remote control......Refer to page 240.

SECTION 8
MECHANICAL ADJUSTMENTS

For Mechanical Adjustments

Refer to mechanical adjustment (8 mm Video MECHANICAL ADJUSTMENT MANUAL III) manual for the adjustments and checks of mechanism section and the mechanical parts replacement. (9-972-732-11)

For setting of the track shift mode, however, refer to the following.

8-1. SETTING THE TRACK SHIFT MODE

Note : Camera part and video part should have been installed.

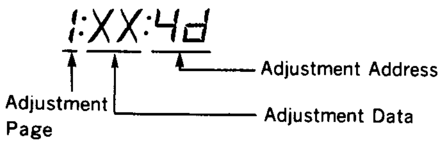
[Setting Method]

1) Set the adjustment commander to the HOLD ON side.
2) Press EDIT SEARCH + button once, and select page 1.
3) Select the adjustment address 4D with FF or REW button.
4) Set to 3X with PLAY and STOP button. (Setting of track shift mode)

Note : 3X should be the number from 31 to 3F. (To display "3X" with PLAY and STOP button is simple to shift.)

(When HOLD OFF once after the setting and HOLD ON again, the display of the address data will be changed. To set the another mode with shifting, repeat the procedures from 3).)

5) Set to the HOLD OFF side in order to set the normal mode.



(1X : TEST 1
2X : TEST 2 ('CH Playback)
3X : TEST 3 (Shift mode)
4X : Shift release)

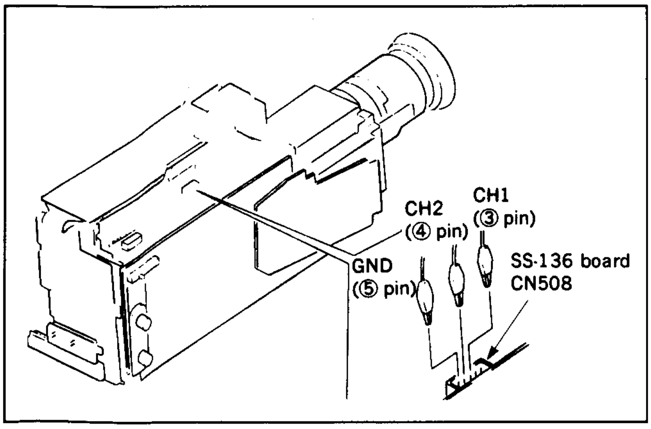


Fig. 8-1.

8-2. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guide, drum, capstan shaft, pinch roller.)
2) Connect to the oscilloscope.
   CH1 : SS-136 board CN508 pin ③ (PB RF)
   CH2 : SS-136 board CN508 pin ④ (SWP)
3) Play back the tracking alignment tape (WR5-1CP) (8-967-995-07).
4) Check that the RF waveform of the oscilloscope is flat at both inlet and outlet sides. When not flat, make adjustment as follows. (Refer to Figs. 8-1 and 8-2.)

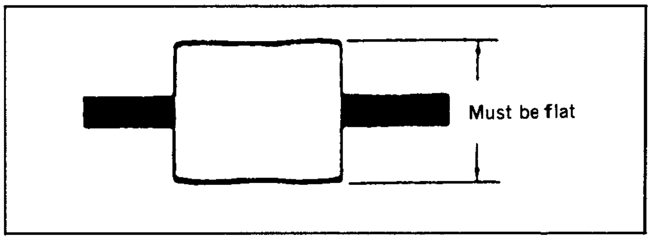


Fig. 8-2.

SECTION 9
CAMERA ADJUSTMENTS

PREPARATION FOR ADJUSTMENT (CAMERA BLOCK)
9-1. LIST OF SERVICING JIGS

- Oscilloscope
- Stabilized power supply (2 units)
- Adjusting screwdriver
- L lench
- Stop watch
- Color monitor TV
- Vectorscope
- Desk-top calculator

Ref. No.	Name	Part No.	Use
J-1	Filter (C14)	J-6080-054-A	Auto white balance adjustment
J-2	ND filter 0.1	J-6080-807-A	
	ND filter 0.3	J-6080-818-A	
	ND filter 0.4	J-6080-806-A	
	ND filter 0.9	J-6080-833-A	
	ND filter 1.0	J-6080-808-A	
J-3	Pattern box PTB-500	J-6029-140-A	
J-4	Color bar chart for pattern box	J-6020-250-A	
J-5	Extension cable (5P)	J-6082-043-A	To connect VC-99 board CN304 and DC-DC converter
	Extension cable (4P)	J-6082-042-A	To connect VC-99 board CN307 and VA-67 board W701
J-6	Extension cable (20P)	J-6082-063-B	To connect VA-67 board CN703 and CT-38 board CN705
J-7	Extension cable (12P)	J-6082-056-A	To connect VC-99 board CN305 and VA-67 board W702
J-8	Camera fixing jig	J-6080-894-A	
J-9	Siemens-star chart Transmission type simens-star chart	J-6080-875-A J-6080-923-A	Either of the siemens-star charts which appear during adjustment may be used.
J-10	Adjustment remote control * 1	J-6082-053-B	
J-11	AF microcomputer data reader jig * 2	J-6082-025-A	
J-12	CPA connector jig	J-6082-109-A	

* 1 Microcomputer IC in the adjustment Remote controller except for μPD7503G-C56-12 (8-759-148-35) does not allow the page selecting. Replace the microcomputer in such a case.

* 2 Change the fixed number of R1 from 10kΩ to 100kΩ in the AF microcomputer data reading jig. (If the number is kept to 10kΩ, the adjustment data can not change because of the difference of of the impedance.)
When adjustment the old-model Handy Cam, 100kΩ is allowed to perform the adustment.

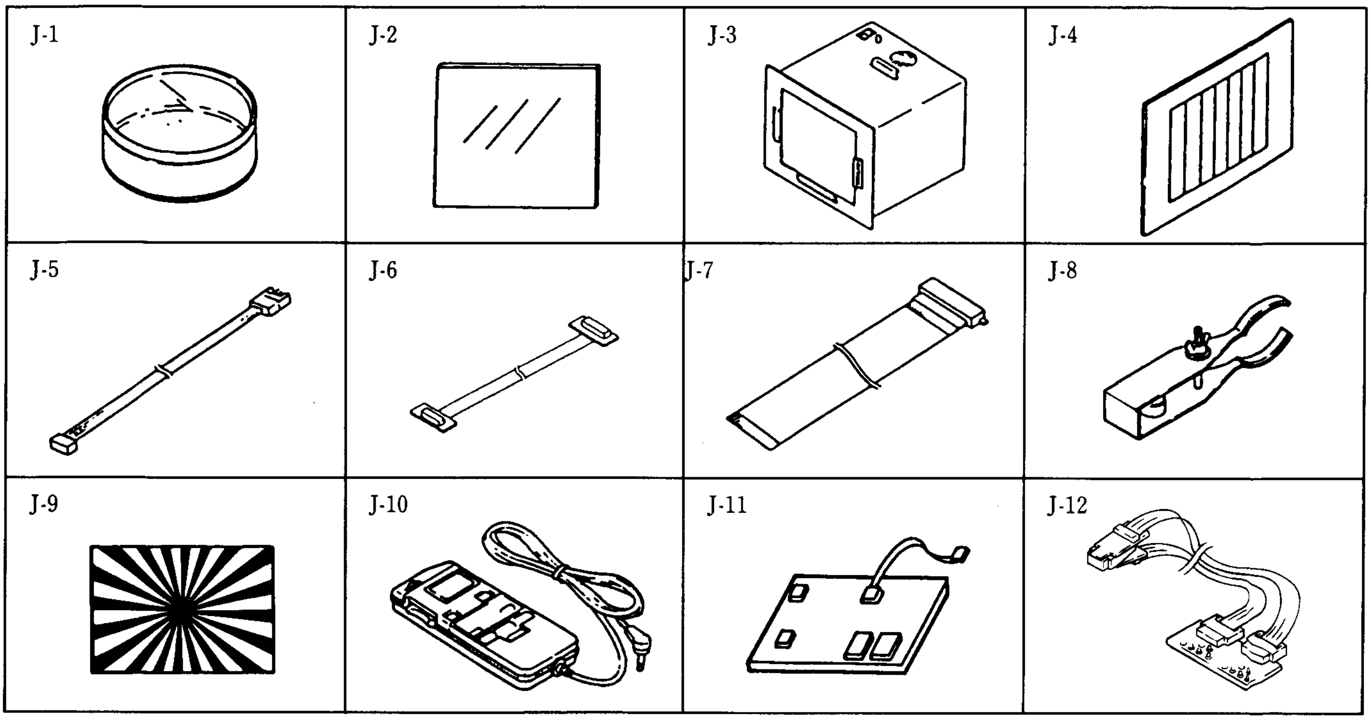

J-1
J-2
J-3
J-4
J-5
J-6
J-7
J-8
J-9
J-10
J-11
J-12

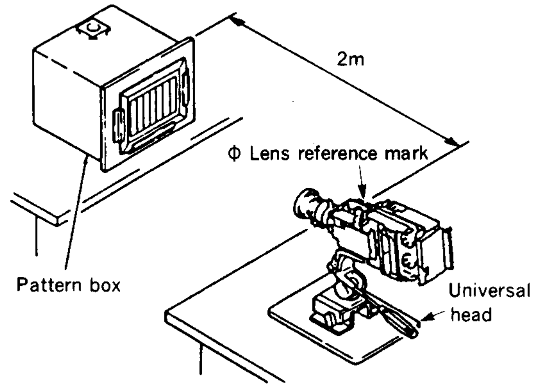
Fig. 9-1.

9-2. PREPARATION FOR ADJUSTMENT

9-2-1. Preparation

Note : Refer to "SECTION 2. DISASSEMBLY" for details of the cabinet and individual boards removal procedure.

1) Connect the camera block and the video block by using the extension cable, and other equipment as shown in Fig. 9-3.
2) EVF (Electrical View Finder) section VF-26 or VF-27 boards is necessary for confirmation of shutter speed, white balance mode and etc.
   If not necessary, it can removed by taking out CN931 on the SW-183 board.
3) MIC board (MC-76 board) is not necessary. Remove it by taking out W651 on the MC-76 board.


2m
Φ Lens reference mark
Pattern box
Universal head

When the camera block and the video block are separated with the cabinet removed, fix by using the camera fixing jig.

Fig. 9-2.

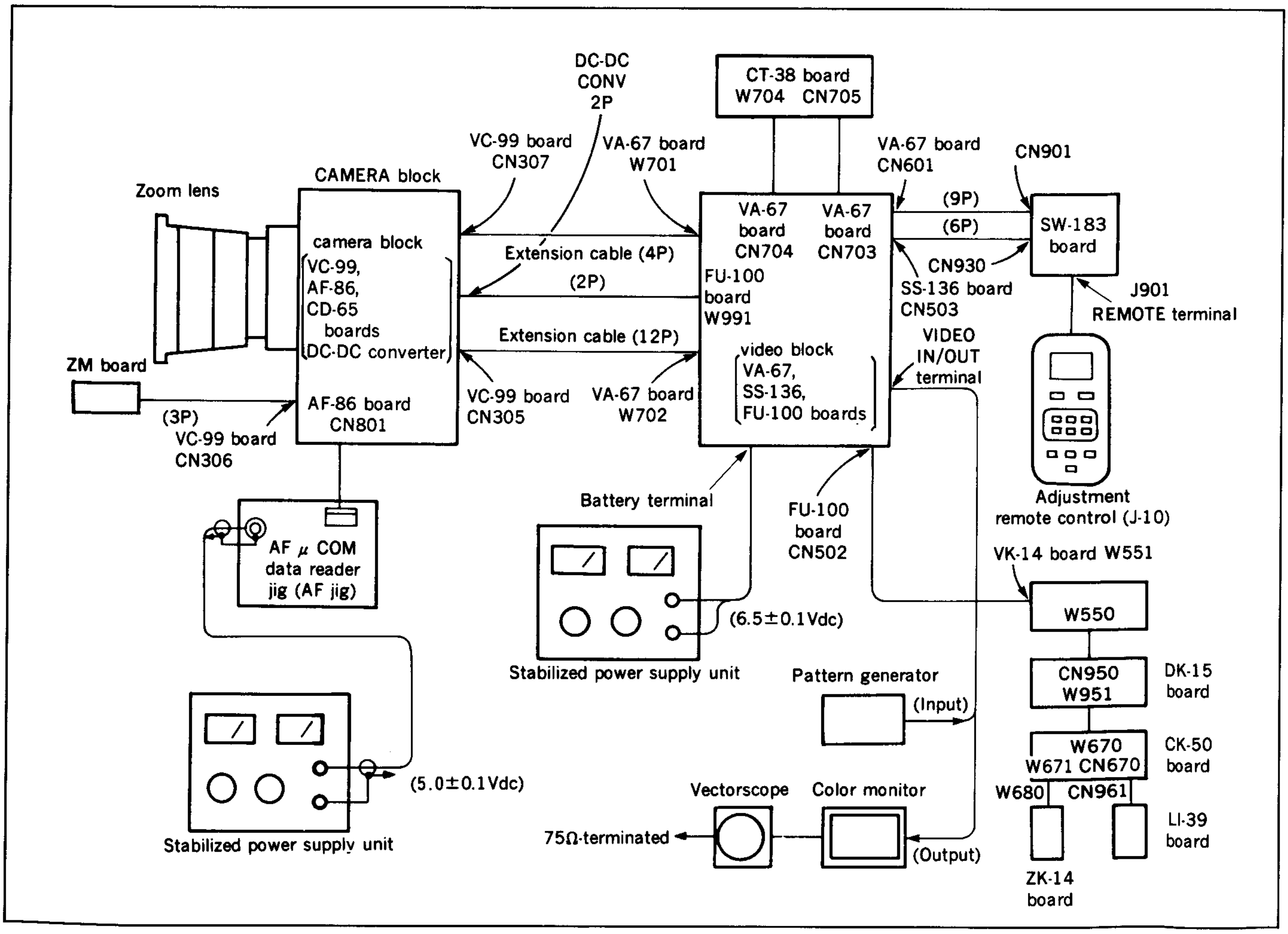

DC-DC CONV 2P
CT-38 board W704 CN705
VC-99 board CN307
VA-67 board W701
VA-67 board CN601
CN901
Zoom lens
CAMERA block
camera block
VC-99,
AF-86,
CD-65
boards
DC-DC converter
Extension cable (4P)
(2P)
Extension cable (12P)
VA-67 board CN704
VA-67 board CN703
FU-100 board W991
video block
VA-67,
SS-136,
FU-100 boards
(9P)
(6P)
SW-183 board
CN930
SS-136 board CN503
J901
REMOTE terminal
VIDEO IN/OUT terminal
ZM board
(3P)
VC-99 board CN306
AF-86 board CN801
VC-99 board CN305
VA-67 board W702
Adjustment remote control (J-10)
Battery terminal
FU-100 board CN502
VK-14 board W551
AF μ COM data reader jig (AF jig)
W550
(6.5±0.1Vdc)
Stabilized power supply unit
Pattern generator
(Input)
CN950 W951
DK-15 board
W670
W671 CN670
CK-50 board
W680
CN961
(5.0±0.1Vdc)
Vectorscope
Color monitor
LI-39 board
Stabilized power supply unit
75Ω-terminated
(Output)
ZK-14 board

Fig. 9-3.

9-2-2. Caution

1) Setting of switches

Unless otherwise specified, set the switches to the following position for making adjustments.

1. AUTO LOCK switch
   ......Lock release position
2. FOCUS button (S673 on CK-50 board)
   ......MANUAL mode
3. WHITE BALANCE button (S676 on CK-50 board)
   ......INDOOR mode ("INDOOR" indication appears on EVF.)
4. SHUTTER SPEED button (S671 on CK-50 board)
   ......NORMAL mode (No indications of "100" "2000", etc. appear on EVF.)

2) Adjustment order

As a rule, adjust in described order.

3) Objects

1. Color bar chart (standard picture frame)
   When making Adjustments by the use of a color bar chart, adjust the picture frame as shown in Fig. 9-4. (Standard picture frame)

Color Bar Chart Standard Picture Frame

☆ Basically, adjust the color bar chart standard picture frame with the under-scanning monitor as shown in Fig. a.

1) Place a black window with the horizontal width same as that of a color bar pattern, respectively on left and right sides of the screen. (A=B)
2) Put together lower ends of the color pattern and under-scanning monitor in the vertical direction.

Fig. a

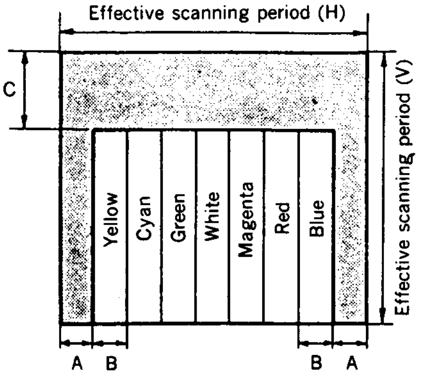

Effective scanning period (H)
C
Yellow
Cyan
Green
White
Magenta
Red
Blue
Effective scanning period (V)
A
B
B
A

Fig. b

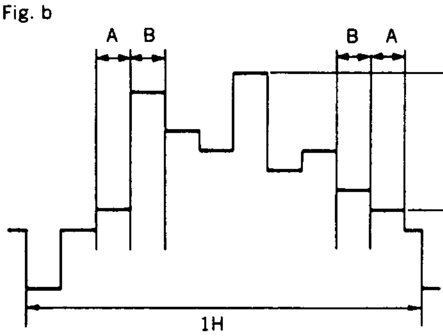
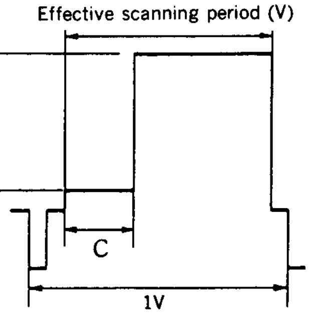


Fig. c

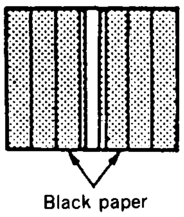

Effective scanning period (V)
C
1V

- To photograph the color bar chart standard picture frame shown in Fig. a. adjust Output Y (CN307 ① on VC-99 board) as shown in Fig. b and c.

Fig. 9-4.

2. All white pattern
   Remove a color bar chart from the pattern box and set the zoom lever fully to the TELE side (68mm).
3. High luminance pattern
   Prepare a high luminance pattern as shown in Fig. 9-5 and adjust the picture frame as shown in Fig. 9-6.
4. Siements star
   orient a camera to have the siemens star center coincide with the monitor screen center on a monitor TV screen.

High luminance pattern


Black paper

Cover a color bar chart with black paper, except half the width of its white stripe. Then shoot the chart in this state.

Fig. 9-5.

High luminance pattern

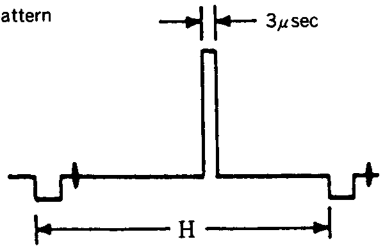


Fig. a (camera output waveform of CPA pin Ⓐ8 on VC-99 board)

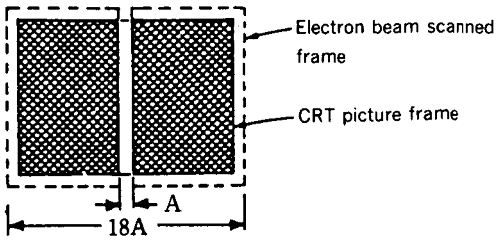

Electron beam scanned frame
CRT picture frame
A
18A

Fig. b (Picture of monitor TV screen)

By operating the camera zooming and orientation have the Fig. a output waveform output and the Fig. b monitor TV image displayed.

Fig. 9-6.

9-2-3. Adjustment Remote Control

In the camera block, the EVR (Electronic Variable Resistor) is used as an adjustment element in place of a conventional semi-fixed resistor. The EVR is controlled by the EVR/AWB microcomputer (VC-99 board IC501). This microcomputer reads the data written in the non-volatile memory inside the microcomputer and sends it to the EVR. The EVR generates an adjustment voltage by D-A conversion of this data (8 bits per one adjustment point).

To adjust, the camera block, therefore, it is necessary to rewrite the adjustment data written in the non-volatile memory. The adjustment remote control is used for this purpose. The adjustment remote control performs bidirectional communications with the microcomputer in the camera block through a remote control signal line (LANC). UP/DOWN commands for adjustment page, address and data are sent from the adjustment remote control to the microcomputer in the camera block. Sent from the microcomputer in the camera block to the adjustment remote control are the adjustment page, address and data.

Note: The microcomputer IC in the adjustment remote controller except for new microcomputer (μPD7503G-C56-12) dose not allow the adjustment page selecting. Replace with the new microcomputer (8-759-148-35) in such a case.

1. Using the Adjustment Remote Control

1) Connect the adjustment remote control to the REMOTE terminal (SW-183 board J901).
(Shift the HOLD switch of the adjustment remote control to the HOLD position (SERVICE position).)
2) Turn on the power for the main unit.
3) If the connection is correct, the following is displayed on the adjustment remote control LCD. (The adjustment data varies from one set to another.)

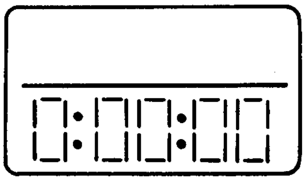


Fig. 9-7. (a)

4) Specify your desired adjustment page by the adjustment remote control.
Pressing the EDIT SEARCH (+) increments the adjustment page. Pressing the EDIT SEARCH (—) decrements it. The adjustment page is shown in the hexadecimal numbers and there are 16 of them from 1 to F. The CAMERA adjustment page is page F and Pressing the EDIT SEARCH (—) buttom one push.

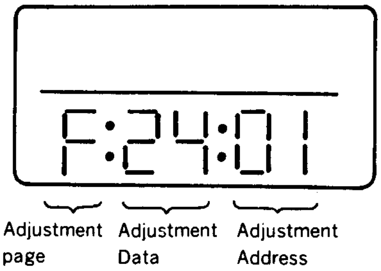


Fig. 9-7. (b)

5) Specify your desired adjustment address by the adjustment remote control. Pressing the FF (▶▶) button increments the adjustment address, and pressing the REW (◀◀) button decrements it.
(The adjustment address is shown in the decimal number and there are 256 of them from 00 to FF. The adjustment address corresponds to the output terminal of the EVR (IC301 on the VC-99 board, IC504 on the VC-99 board, and IC004 of the MX-10 board). Refer to Table 9-1 for adjustment of each address.)
6) Make adjustment by increasing/decreasing the adjustment data.
Pressing the PLAY (▶) button increases the adjustment data, and pressing the STOP (■) button decreases it.

- The adjustment data is shown in the hexadecimal number and assumes 256 kinds of values ranging from 00 to FF.

Hexadecimal No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Indication of LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal converted value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 9-1.

- The adjustment data corresponds to the output voltage of the EVR (IC301 on the VC-99 board, IC504 on the VC-99 board, and IC004 on the MX-10 board) as follows:
  MX-10 board IC004 : 2.0 ⟷ 5.0 Vdc
  VC-99 board IC301 : 0 ⟷ 5.0Vdc
  VC-99 board IC504 : 1.0 ⟷ 3.5Vdc

7) Change the adjustment address with the FF (▶▶) or REW (◀◀) button in order to store the adjustment data into the non-volatile memory built in the EVR/AWB microcomputer (VC-99 board IC501).
(If this operation is omitted, new adjustment data will not be stored into the non-volatile memory.)
8) There is a function provided to make note of the last error cuased by the COUNTER RESET button during operation of the set even if the power is turned off. This LAST MEMO EMERGENCY (last error) can be cleared.

2. Cautions for Using the Adjustment Remote Control

Erroneous operation of the adjustment remote control may delete correct adjustment data. To avoid this, it is recommended to make note of all the adjustment data before adjustment and of new adjustment data every time adjustment of one item is completed.

3. List of Adjustment Addresses

Use the adjustment page F for the camera part adjustment of this unit.

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
01	MX-10 board IC004 pin ⑱	R CONT	Auto white balance adjustment	
02	MX-10 board IC004 pin ⑲	B CONT		
03	MX-10 board IC004 pin ②	C_1 GAIN	Matrix (3) C_1 gain adjustment	
04	MX-10 board IC004 pin ③	B GAIN	Pre-white balance adjustment	
05	MX-10 board IC004 pin ④	R GAIN		
06	MX-10 board IC004 pin ⑤	Y_2 GAIN	Matrix (2) Y_2 gain adjustment	
07	MX-10 board IC004 pin ⑥	Y_1 GAIN	Matrix (1) Y_1 gain adjustment	
08	MX-10 board IC004 pin ⑦	Y_H GAIN	Y_H level adjustment	
09	MX-10 board IC004 pin ⑧	R-Y GAIN	Color reproducibility adjustment	
0A	MX-10 board IC004 pin ⑨	B-Y GAIN		
0B	MX-10 board IC004 pin ⑫	R-Y HUE		
0C	MX-10 board IC004 pin ⑬	B-Y HUE		
0D	VC-99 board IC301 pin ⑱	SHP LEVEL	H aperture Adjustment	
0E	VC-99 board IC301 pin ⑲	Y LEVEL	White clip, Y level adjustments	
0F	VC-99 board IC301 pin ②	VAP GAIN		
10	VC-99 board IC301 pin ③	SET UP	Set up adjustment	
11	VC-99 board IC301 pin ④	C LEVEL	Chroma level adjustment	
12	VC-99 board IC301 pin ⑤	V SUB CONT	V sub adjustment	
13	VC-99 board IC301 pin ⑥	PG CONT	PG cont adjustment	
14	VC-99 board IC301 pin ⑦	$Y\gamma$ CONT		
15	VC-99 board IC301 pin ⑧	WHITE CLIP	White clip adjustment	
16	VC-99 board IC301 pin ⑨	SYNC LEVEL	Sync level adjustment	
17	VC-99 board IC301 pin ⑫	BURST LEVEL	Burst level adjustment	
18	VC-99 board IC301 pin ⑬	MAX GAIN	Set up, Max gain adjustments	
19	VC-99 board IC504 pin ⑱	IRIS REF	Iris adjustment	
1A	VC-99 board IC504 pin ⑲	AGC REF	AGC adjustment	
1B	VC-99 board IC504 pin ②	HALL GAIN	Hall adjustment	
1C	VC-99 board IC504 pin ③	HALL OFFSET		
1D	VC-99 board IC504 pin ④	FADER LEVEL		
1E	VC-99 board IC504 pin ⑤	———		
1F	VC-99 board IC504 pin ⑥	FADER CONT		
20	VC-99 board IC504 pin ⑦	FOCUS SPEED		
21	VC-99 board IC504 pin ⑧	ZOOM SPEED		
22	VC-99 board IC504 pin ⑨	M IRIS CONT	Not used	
23	VC-99 board IC504 pin ⑫	M AGC CONT		
24	VC-99 board IC504 pin ⑬	AGC IN PULSE		

Table 9-2 (1).

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
25		AGC LD REF		
26		AGC MD	AF adjustment	
27		AGC HD		
28		LD-B		
29		HD-B		
2A		M SPEED-A	Focus motor speed adjustment	
2B		M SPEED-B		
2C		M SPEED-C		
2D		M SPEED-D		
2E		M SPEED-E		
2F		HOLD TIME		
30		PA SET	AF adjustment	
31		AGC LD TH		
32		HD TH1		
33		HD TH2		
34		ZOOM-POSI 1		
35		ZOOM-POSI 2		
36		ZOOM-POSI 3		
37		ZOOM-POSI 4		
38		ZOOM-POSI 5		
39		GETA MIN		
3A		GETA		
3B		BACK RUSH		
3C		MACRO TIME OUT		
3D		ZOOM-TAN-MASK		
3E		BACK RUSH ZOOM		
3F		IRIS L		
40		IRIS H		
41		MACRO END COUNT		
42		FILTER GAIN		
43		LD FILTER GAIN		
44		AGC LD BIAS		
45		AGC CONT W	AF adjustment	
46		AGC CONT B		

Table 9-2 (2).

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
47		AGC LD GAIN		
48		SHIND STOP		
49		INV COUNT MAX		
4A		ADJ PWM	Focus motor speed adjustment	
4B		AGC COUNT TH		
4C		END COUNT THF		
4D		END COUNT THF		
4E		FDL GIKAI TH		
4F		FDN TH		
50		FDP TH		
51		HANTING ZONE		
52		M SPEED UP		
53		PA GIKAI TH		
54		———		
55		———		
56		———		
57		———		
58		ZOOM-SPEED 1		
59		ZOOM-SPEED 2		
5A		ZOOM-SPEED 3		
5B		ZOOM-SPEED 4		
5C		MAN PWM SPEED	Focus motor speed adjustment	
5D		MAN F SPEED		
5E		———		
5F		———		
60		IRIS REF-NOR	Standard AE level adjustment	
61		IRIS REF-PO		
62		IRIS REF-SP		
63		———		
64		———		
65		———		
66		———		
67		———		
68		———		
69		———		

Table 9-2 (3).

Adjust-ment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
6A		————		
6B		MAXSHUT-PO (H)		
6C		MAXSHUT-PO (L)		
6D		MAXSHUT-SP (H)		
6E		MAXSHUT-SP (L)		
6F		REF-WIDTH (H)		
70		REF-WIDTH (L)		
71		SHUT-MULTI (H)		
72		SHUT-MULTI (L)		
73		SHUT-COUNT 1		
74		SHUT STEP-MULTI		
75		IRIS OPEN		
76		REF-TURBO (H)		
77		REF-TURBO (L)		
78		TURBO-WIDTH (H)		
79		TURBO-WIDTH (L)		
7A		TURBO-TR (H)		
7B		TURBO-TR (L)		
7C		SHUT-COUNT 2		
7D		SHUT-COUNT 3		
7E		————		
7F		————		
80		USER R-Y GAIN		
81		USER B-Y GAIN		
82		USER B-Y HUE		
83		USER R-Y HUE		
84		USER SHP LEVEL		
85		USER Y LEVEL		
86		————		
87		————		
88		————		
89		————		
8A		————		
8B		————		
8C		————	Standard AE level adjustment	

Table 9-2 (4).

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
8D		—		
8E		—		
8F		—		
90		R3200 MSB		
91		R3200 LSB		
92		B3200 MSB		
93		B3200 LSB		
94		G3200 MSB		
95		G3200 LSB		
96		SHUTTER IN	Shutter IN/OUT adjustment	
97		SHUTTER OUT		
98		START R	Auto white balance adjustment	
99		START B		
9A		R OUT DOOR		
9B		B OUT DOOR		
9C		—		
9D		—		
9E		—		
9F		—		
A0		Ra	Auto white balance adjustment	
A1		Rb		
A2		Rc		
A3		Ba		
A4		Bb		
A5		Bc		
A6		R/B TOP		
A7		R/B MDL		
A8		R/B BTM		
A9		B/R TOP		
AA		B/R MDL		
AB		B/R BTM		
AC		BTM SLP R		
AD		BTM SLP B		
AE		MDL SLP R		
AF		MDL SLP B		

Table 9-2 (5).

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
B0		TOP SLP R	Auto white balance adjustment	
B1		TOP SLP B		
B2		KEIKO R		
B3		KEIKO B		
B4		BTM UP		
B5		BTM DWN		
B6		MDL UP		
B7		MDL DWN		
B8		TOP UP	Auto white balance adjustment	
B9		TOP DWN		
BA		KEIKO		
BB		KEIKO DWN		
BC		R TOP LMT		
BD		R DWN LMT	Auto white balance adjustment	
BE		B TOP LMT		
BF		B IN TOP		
C0		B IN MAX		
C1		B OUT MIN		
C2		B OUT DWN		
C3		B DWN LMT		
C4		LL LMT		
C5		TM DIVID		
C6		BM DIVID		
C7		DELAY TM		
C8		FAST TM		
C9		OUT HYS OFF		
CA		OUT B HYS		
CB		———		
CC		———		
CD		———		
CE		———		
CF		———		
D0		SYSTEM	NTSC/PAL select	
D1		———		
D2		———		

Table 9-2 (6).

<table>
<tr><th>Adjustment Address</th><th>Adjustment Voltage Output Terminal</th><th>Adjustment Item</th><th>Remarks</th><th>Memo Column</th></tr>
<tr><td>D3</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D4</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D5</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D6</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D7</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D8</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D9</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DA</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DB</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DC</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DD</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DE</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DF</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E0</td><td></td><td>DISPLAY MODE</td><td>The following adjustment mode is selected by changing the adjustment data.
<table>
<tr><th>Adjustment data.</th><th>Adjustment Mode</th></tr>
<tr><td>00</td><td>DISPLAY MODE R, B, CONT</td></tr>
<tr><td>01</td><td>NEW R, B</td></tr>
<tr><td>02</td><td>R RATIO</td></tr>
<tr><td>03</td><td>B RATIO</td></tr>
<tr><td>04</td><td>R GAIN</td></tr>
<tr><td>05</td><td>B GAIN</td></tr>
<tr><td>06</td><td>RM DATA</td></tr>
<tr><td>07</td><td>GM DATA</td></tr>
<tr><td>08</td><td>BM DATA</td></tr>
<tr><td>09</td><td>NORM R</td></tr>
<tr><td>0A</td><td>NORM B</td></tr>
<tr><td>0B</td><td>R DATA</td></tr>
<tr><td>0C</td><td>G DATA</td></tr>
<tr><td>0D</td><td>B DATA</td></tr>
<tr><td>0E</td><td>R_1, B AIM</td></tr>
<tr><td>0F</td><td>ERROR</td></tr>
</table></td><td></td></tr>
<tr><td>E1</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E2</td><td></td><td>—</td><td></td><td></td></tr>
</table>

Table 9-2 (7).

<table>
<tr><th>Adjustment Address</th><th>Adjustment Voltage Output Terminal</th><th>Adjustment Item</th><th>Remarks</th><th>Memo Column</th></tr>
<tr><td>E3</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E4</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E5</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E6</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E7</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E8</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E9</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>EA</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>EB</td><td></td><td>MODE</td><td>The following adjustment mode is selected by changing the adjustment data.
<table>
<tr><th>Adjustment Data</th><th>Adjustment Mode</th></tr>
<tr><td>00</td><td>NORMAL</td></tr>
<tr><td>01</td><td>F-HANTING</td></tr>
<tr><td>03</td><td>ZOOM-POSI</td></tr>
<tr><td>05</td><td>IRIS-POSI</td></tr>
<tr><td>0B</td><td>AGC-CONT</td></tr>
<tr><td>11</td><td>SHUTTER IN/OUT</td></tr>
<tr><td>13</td><td>IRIS LEVEL</td></tr>
<tr><td>ED</td><td>FILTER-MD</td></tr>
<tr><td>EF</td><td>FILTER-HD</td></tr>
<tr><td>F1</td><td>FILTER-LD</td></tr>
<tr><td>F5</td><td>FP3 HANTING</td></tr>
</table></td><td></td></tr>
<tr><td>EC</td><td></td><td>AWB MODE 3</td><td></td><td></td></tr>
<tr><td>ED</td><td></td><td>AWB MODE 2</td><td></td><td></td></tr>
<tr><td>EE</td><td></td><td>AWB MODE 1</td><td>The following auto white balance adjustment mode is selected by changing the adjustment data.
<table>
<tr><th>Adjustment Data</th><th>Adjustment Mode</th></tr>
<tr><td>00</td><td>AWB MODE 1</td></tr>
<tr><td>10</td><td>WB DIRECT</td></tr>
<tr><td>F0</td><td>WB FREE</td></tr>
<tr><td>01</td><td>3200k Data fetch 1</td></tr>
<tr><td>23</td><td>3200k Data fetch 2</td></tr>
</table></td><td></td></tr>
</table>

Table 9-2 (8).

Adjust-ment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
EF		————		
F0		————		
F1		————		
F2		————		
F3		————		
F4		————		
F5		————		
F6		————		
F7		————		
F8		————		
F9		————		
FA		————		
FB		————		
FC		————		
FD		————		
FE		————		
FF		————		

Table 9-2 (9).

9-2-4. Checkpoint Array

Most measurement points for adjustment of the camera block are concentrated on the checkpoint array of the VC-99 board. Solder a short lead wire, etc. to the terminal required for adjustment and connect an oscilloscope. Table 9-3 shows the terminal numbers and signal names of the checkpoint array.

Note. The CPA connector jig (J-6082-109-A) allows you to connect an oscilloscope easily.

Terminal No.	Signal Name	Terminal No.	Signal Name
A1	N.C	B1	N.C
A2	PG CONT	B2	N.C
A3	MODE B	B3	Y (LPF) OUT
A4	N.C	B4	V_{SUB}
A5	VAP OUT	B5	VAP SLICE
A6	TP	B6	N.C
A7	WB-G	B7	Y_H GAIN
A8	CAM Y	B8	Y_2 GAIN
A9	Y_H	B9	N.C
A10	CAM C	B10	GND
A11	Y_H OUT 1	B11	IRIS OUT

Table 9-3.

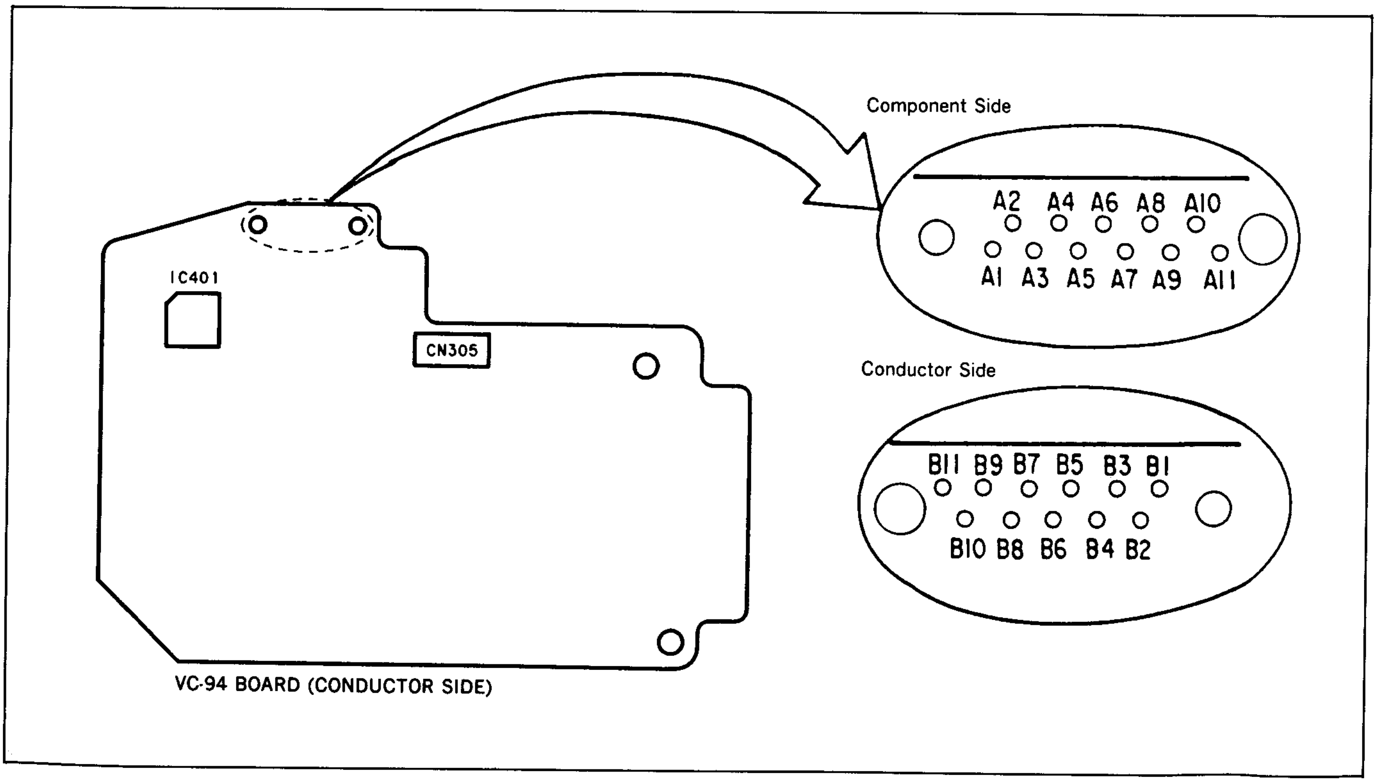

Component Side
A2 A4 A6 A8 A10
A1 A3 A5 A7 A9 A11
Conductor Side
B11 B9 B7 B5 B3 B1
B10 B8 B6 B4 B2
IC401
CN305
VC-94 BOARD (CONDUCTOR SIDE)

Fig. 9-8.

9-2-5. AF Microcomputer Data Reader Jig

The AF microcomputer data reader jig converts adjustment serial data outputted from the AF microcomputer (AF-86 board CN801) (different data are outputted depending on the adjustment mode, such as HALL (iris) state, focus state, focus motor speed, zoom ring position, etc.) into 2-digit hexadecimal numbers and indicates on the LED.

Note:

Change the fixed number of R1 from 10kΩ to 100kΩ in the AF microcomputer data reader jig. (If the number is kept to 10kΩ, the adjustment data can not change because of the difference of the impedance.)

When adjusting the old-model Handy Cam, 100kΩ is allowed to perform the adjustment.

[Connection]

Connect as shown in the figure below:

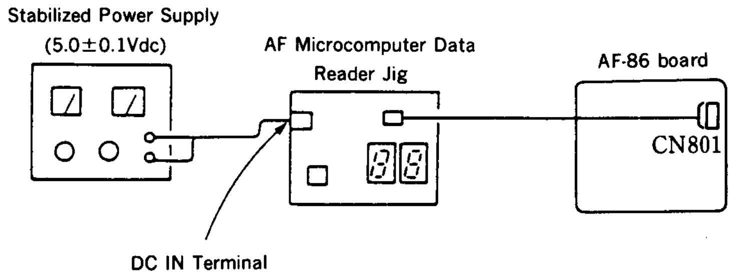


Fig. 9-9.

9-2-6. Data Processing

In order to obtain adjustment data in some adjustment items, it is necessary to compute the display data (hexadecimal number) of the AF microcomputer data reader jig and adjustment remote control. In this case, convert the hexadecimal number into the decimal number before computation, convert its computed result back into the decimal number to assume it as the adjustment data. Table 9-4.shows a hexadecimal-decimal conversion table.

Hexadecimal — Decimal Conversion Table

Higher Digit of Hex. No. / Lower Digit of Hex. No.	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	② D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
①→ B (b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: Values in parentheses are those displayed on the AF microcomputer reader jig or adjustment remote control.

(Example) When the AF microcomputer reader jig or adjustment remote control displays "BD(bd)";
Since the higher digit of the hexadecimal number is B (b) and its lower digit is D (d), the decimal number to be obtained is "189" at an intersecting point of ① and ② in the table above.

Table. 9-4.

9-3. ADJUSTMENT OF CAMERA SYSTEM

- In principle, all adjustments must be made in accordance with Adjustment procedure.
- When replacing lens, do not forget to make the following adjustment.
- When replacing CCD imager or lens, do not forget to adjust the camera system property.

9-3-1. Prime Oscillation Adjustment (CD-65 Board)

Object	Color bar chart standard picture frame
Measurement point	DT-77 board pin ③
Measuring instrument	Frequency counter
Adjustment element	CT122
Specified value	14187500±71Hz

Note : Connect the frequency counter through a buffer amplifier (Oscilloscope, etc.) having high impedance and low capacitance.

[Adjustment Method]

1) Adjust to 14187500±71Hz with CT122.

9-3-2. PLL Adjustment (CD-65 Board)

Object	Optional
Measurement point	See Fig. 9-10.
Measuring instrument	Digital voltmeter
Adjustment element	CT121
Specified value	2.5±0.2Vdc

[Adjustment Method]

1) Adjust to 2.5±0.2Vdc with CT121.

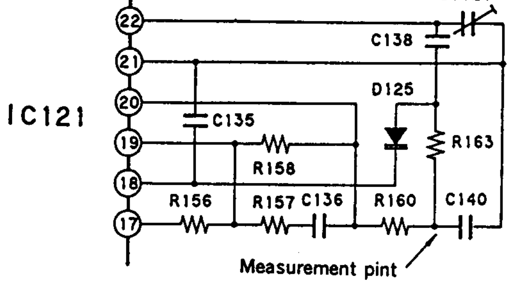


Fig. 9-10.

9-3-3. Flange Back Adjustment

Object	Siemens star (at 2 m in front of the lens datum level Φ mark)
Measurement point	Check with the monitor TV.
Measuring instrument	
Adjustment element	Flange back adjusting pin
Tools	Phillips screwdriver

[Adjustment Method]

1) Press the FOCUS button to select the MANUAL mode.
2) Place the Siemens star at a distance of 2 m in front of the lens datum level (refer to Fig. 9-2).
3) Adjust a camera block position to center the Siemens star on the monitor screen with the monitor screen.
4) Check that the lens zoom lever can be moved fully to the WIDE end (8.5 mm) and TELE end (68 mm), respectively, and fix it at the WIDE end. (When this is done, check also zooming operation on the monitor screen.)
5) Set the lens focusing mark at the center of "2".

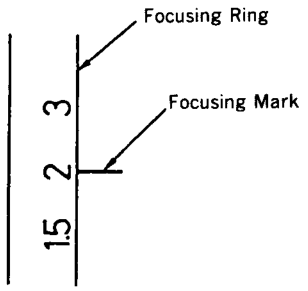


Fig. 9-11.

6) Loosen the flange back setscrew ❶ with the Phillips screwdriver. (Refer to Fig. 9-13)
7) Viewing the monitor screen, turn the flange back adjusting pin ❷ to make clearest the wedge located at the center of the Siemens star on the screen. (Turn it 2 to 3 times to the right and left to check the wedge to be clearest.)
   Note : Do not turn the adjusting pin excessively in one direction at a time.
8) Holding the flange back adjusting pin ❷ not to turn it further, tighten the flange back setscrew ❶.
9) With the zoom lever fixed at the WIDE end, turn the focusing ring and stop it at a position which provides the clearest image of the wedge. Check that the focusing ring is within the range shown in Fig. 9-12 at this time.

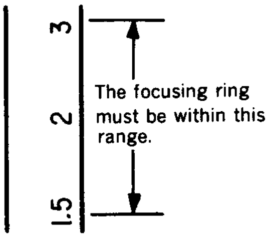


Fig. 9-12.

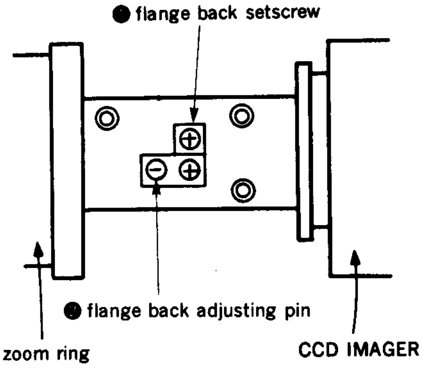


Fig. 9-13.

10) Fix the zoom lever at the TELE end.
11) Turn the focusing ring and stop it at a position which provides the clearest wedge image. When this is done, check that the focusing ring is within a range of ±1.5mm from the center of "2".

9-3-4. Camera DC-DC Converter Voltage Check (VC-99 Board/CD-65 Board)

Measuring isntrument	Digital voltmeter
15V check	
Measurement point	CN101 pin ① (CD-65 Board)
Specified value	$15.0\pm0.2V_{DC}$
−9V check	
Measurement point	CN101 pin ② (CD-65 Board)
Specified value	$-9.00\pm0.15V_{DC}$
4.9V check	
Measurement point	CN101 pin ③ (CD-65 Board)
Specified value	$4.9\pm0.1V_{DC}$
CAM 4.9V check	
Measurement point	CN304 pin ④ (VC-99 Board)
Specified value	$4.9\pm0.1V_{DC}$

[Checking Method]

1) Each supply voltage must meet the specified value.

9-3-5. EVR Initial Setting of adjustment page F

Set to the following initial settings of the adjustment data only when the CCD IMAGER was replaced.

Make initial setting of adjustment data when the EVR/AWB microcomputer is replaced.

(Pre-replacement microcomputer data will do.)

Adjustment Address	Adjustment Data Initial Value
0E (Y LEVEL)	9C
0F (VAP GAIN)	90
12 (VSUB CONT)	3A
13 (PG CONT)	5A
14 ($Y\gamma$ CONT)	AE
15 (WHITE CLIP)	FF
18 (MAX GAIN)	E0
19 (IRIS REF)	4C
1F (FADER CONT)	00
25 (AGC LD REF)	B0
26 (AGC MD)	A0
27 (AGC HD)	B0
28 (LD B)	30
29 (HD B)	30
2F (HOLD TIME)	3C
30 (PA SET)	E5
31 (AGC LD TH)	A0

Adjustment Address	Adjustment Data Initial Value
32 (HD TH1)	30
33 (HD TH2)	1E
34 (ZOOM-POSI 1)	0F
35 (ZOOM-POSI 2)	3C
36 (ZOOM-POSI 3)	6B
37 (ZOOM-POSI 4)	9A
38 (ZOOM-POSI 5)	CA
39 (GETA MIN)	05
3A (GETA)	10
3B (BACK RUSH)	05
3C (MACRO TIME OUT)	07
3D (ZOOM-TAN-MASK)	30
3E (BACK RUSH ZOOM)	0A
3F (IRIS L)	AC
40 (IRIS H)	C0
41 (MACRO END COUNT)	3C
42 (FILTER GAIN)	02
43 (LD FILTER GAIN)	06
44 (AGC LD BIAS)	80
45 (AGC COUNT W)	30
46 (AGC COUNT B)	FF
47 (AGC LD GAIN)	A4
48 (SHIND STOP)	20
49 (INV COUNT MAX)	10
4A (ADJ PWM)	FF
4B (AGC COUNT TH)	0A
4C (END COUNT THF)	2A
4D (END COUNT THN)	2A
4E (FDL GIKAI TH)	03
4F (FDN TH)	FD
50 (FDP TH)	03
51 (HANTING ZONE)	05
52 (M SPEED UP)	01
53 (PA GIKAI TH)	09
58 (ZOOM-SPEED 1)	20
59 (ZOOM-SPEED 2)	20
5A (ZOOM-SPEED 3)	50
5B (ZOOM-SPEED 4)	53
5D (MAN F SPEED)	30

Adjustment Address	Adjustment Data Initial Value
60 (IRIS REF NOR)	60
61 (IRIS REF PO)	60
62 (IRIS REF SP)	60
6B (MAX SHUT-PO (H))	00
6C (MAX SHUT-PO (L))	CE
6D (MAX SHUT-SP (H))	00
6E (MAX SHUT-SP (L))	E6
6F (REF-WIDTH (H))	01
70 (REF-WIDTH (L))	00
71 (SHUT-MULTI (H))	06
72 (SHUT-MULTI (L))	00
73 (SHUT-COUNT 1)	06
74 (SHUT STEP-MULTI)	02
75 (IRIS-OPEN)	20
76 (REF-TURBO (H))	06
77 (REF-TURBO (L))	00
78 (TURBO-WIDTH (H))	01
79 (TURBO-WIDTH (L))	00
7A (TURBO-TR (H))	01
7B (TURBO-TR (L))	00
7C (SHUT-COUNT 2)	01
7D (SHUT-COUNT 3)	01
7E (IRIS CLOSE DATA)	F7
80 (USER R-Y GAIN)	10
81 (USER B-Y GAIN)	0D
82 (USER B-Y HUE)	0D
83 (USER R-Y HUE)	0C
84 (USER SHP LEVEL)	0A
85 (USER Y LEVEL)	0C
96 (SHUTTER IN)	B1
97 (SHUTTER OUT)	8B
AC (BTM SLP R)	48
AD (BTM SLP B)	48
AE (MDL SLP R)	40
AF (MDL SLP B)	30

Adjustment Address	Adjustment Data Initial Value
B1 (TOP SLP B)	10
B2 (KEIKO R)	80
B3 (KEIKO B)	30
B4 (BTM UP)	CF
B5 (BTM DWN)	98
B6 (MDL UP)	BE
B7 (MDL DWN)	9B
BA (KEIKO)	C4
BB (KEIKO DWN)	AC
BC (R TOP LMT)	A0
C3 (B DOWN LMT)	26
C4 (LL LMT)	06
C5 (TM DIVID)	6E
C6 (BM DIVID)	41
C7 (DELAY TM)	0A
C8 (FAST TM)	30
C9 (OUT HYS OFF)	15
CA (OUT B HYS)	0D
D0 (SYSTEM)	01
E0 (DISPLAY MODE)	FF
EB (MODE)	00
EC (AWB MODE 3)	01
ED (AWB MODE 2)	00
EE (AWB MODE 1)	00

Table. 9-5.

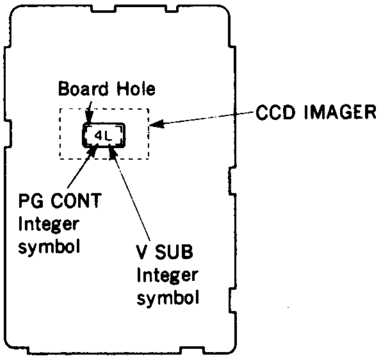
[Adjustment Method]

1) Set the adjustment page to F with the adjustment remote control.
2) Set the adjustment data for each adjustment address to the initial value with the adjustment remote control.
3) Change the adjustment address in order to memorize the last adjustment data.

9-3-6. PG CONT/V SUB Adjustment (CD-65 Board)

Note : PG CONT specified voltage and V SUB specified volatage are indicated by the two digits on CCD imager.

CD-65 BOARD (CONDUCTOR SIDE)



- PG CONT

Integer symbol	Voltage (V)
0	0.5
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0

- V SUB

Integer symbol	Voltage (V)	Integer symbol	Voltage (V)	Integer symbol	Voltage (V)
A	7.0	J	11.0	S	15.0
B	7.5	K	11.5	T	15.5
C	8.0	L	12.0	U	16.0
D	8.5	M	12.5	V	16.5
E	9.0	N	13.0	W	17.0
F	9.5	P	13.5	X	17.5
G	10.0	Q	14.0	Y	18.0
H	10.5	R	14.5	Z	18.5

Example : For 「4L」 display,
•PG CONT=2.5V
•V SUB=12.0V

Fig. 9-14.

A. PG CONT Adjustment

Object	Not used
Measurement point	Checkpoint array pin (A2) (PG CONT)
Measuring instrument	Digital voltmeter
Adjustment page	F
Adjustment address	13 (PG CONT)
Specified value	(CCD imager specified voltage) ± 0.1V_{DC}

[Adjustment Method]

1) Set the adjustment page F and the adjustment address 13 with the adjustment remote control.
2) Change the adjustment data to be (CCD imager specified voltage) ± 0.1Vdc with the adjustment remote control.
3) Change the adjustment address to store the adjustment data.

B. V SUB Adjustment

Object	Not used
Measurement point	Checkpoint array pin (B4) (V SUB)
Measuring equipment	Digital voltmeter
Adjustment page	F
Adjustment address	12 (V SUB)
Specified value	(CCD imager specified voltage) ±3%

[Adjustment Method]

1) Set the adjustment page F and the adjustment address 12 with the adjustment remote control.
2) Change the adjustment data to be (CCD imager specified voltage) ±3% with the adjustment remote control.
3) Change the adjustment address to store the adjustment data.

9-3-7. HALL Adjustment (AF-86 Board)

Object	White pattern standard picture frame All black (Put a black cap over lens)
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig
Adjustment page	F
Adjustment address	1B (HALL GAIN) 1C (HALL OFFSET)
Specified value	White pattern : C0±1 All black : 03±2

[Adjustment Method]

1) Set the adjustment page to F with the adjustment remote control.
2) Set the adjustment address EB and the adjustment data 05 with the adjustment remote control.
3) Change the adjustment data of address 1B and 1C, so that the data of white pattern is C0±1, all black is 03±2.
4) Change the adjustment address to store the adjustment data.

9-3-8. IRIS Adjustment (VC-99 Board)

Object	Color bar chart standard picture frame
Filter	ND filter : 0.5 (0.1+0.4)
Measurement point	Checkpoint array pin (B11) (IRIS OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	19 (IRIS)
Specified value	150±10 mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 19 with the adjustment remote control.
2) With no ND filter attached, change the adjustment data with the adjustment control to adjust the IRIS OUT signal level to 150±10 mV.
3) Attach the ND filter 0.5 (0.1+0.4) in front of the lens and check that the signal level changes smoothly.
4) Remove the ND filter and check that the signal level is 150±20 mV.
5) When the specified value is not met, repeat the steps 2) through 4).
6) Change the adjustment address in order to store the adjustment data.

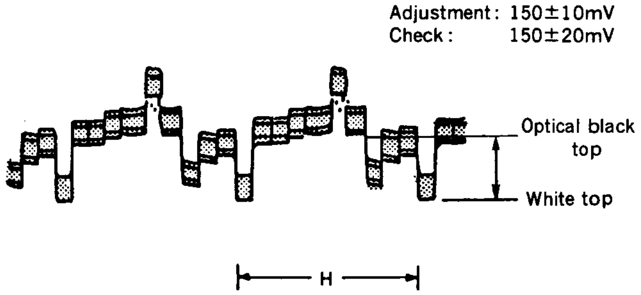


Fig. 9-15.

9-3-9. Shutter IN/OUT Adjustment (AF-86 Board)

Object	White pattern standard picture frame
Filter	ND filter : 0.5 (0.1+0.4)
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig
Adjustment page	F
Adjustment address	97 (SHUTTER OUT) 96 (SHUTTER IN)

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Set the adjustment address EB and the adjustment data 11 with the adjustment remote control.
3) Change the adjustment address in order to store the adjustment data.
4) Set the 1/2000 mode with the shutter speed button.
5) Set the 👤 mode with the program AE button.
6) Attach the ND filter 0.5 (0.1+0.4) to the front of the lens, and confirm that the data of AF microcomputer data reader jig is more than 81. (This data is assumed as data S.)
7) Set the adjustment address 97 with adjustment remote control and enter to the adjustment data S.
8) Set the adjustment address 96 with adjustment remote control and enter to the adjustment data (S+0A).
9) Change the adjustment address in order to store the adjustment data.
10) Attach the black cap to the front of the ND filter 0.5 and confirm that the data of AF microcomputer data reader jig is FF.
11) After adjustment, set the adjustment address EB and the adjustment data 00. Change the adjustment address in order to store the adjustment data.

9-3-10. AGC Adjustment (VC-99 Board)

Note : When there is much noise, measure by inserting 5.6kΩ resistance.

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin (B3) (Y (LPF) OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	1A (AGC)
Specified value	180±5 mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 1A with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to set the Y (LPF) signal level to 180±5 mV.
3) Change the adjustment address in order to store the adjustment data.

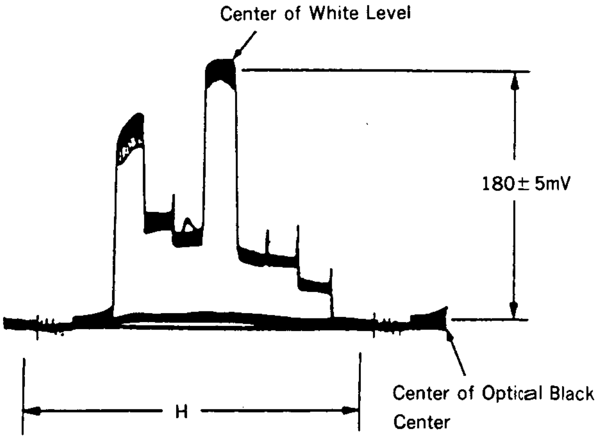


Fig. 9-16.

9-3-11. Matrix Adjustment

(1) Y1 Gain Adjustment (VC-99 Board)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin(A5)(VAP OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	07 (Y_1 Gain)
Specified value	$Y_0-Y_1=0\pm5$mV

[Preparation]

1) Short the checkpoint array pin(B8)(Y_2 Gain) and pin(B5) (VAP SLICE) with GND.

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjustment address 0F by the adjustment remote control and preset the adjustment data to be 00. (VAP GAIN : MAX)
3) Select the adjustment address 07 by the adjustment remote control.
4) Change the adjustment data and set the Y_0-Y_1 waveform to be a straight line. (There should not be difference.)
5) Change the adjustment address in order to store the adjustment data.
6) Open the checkpoint array pin(B8)and pin(B5) .

Note : After the adjustment, be sure to adjust the matrix (2) Y_2 Gain Adjustment.

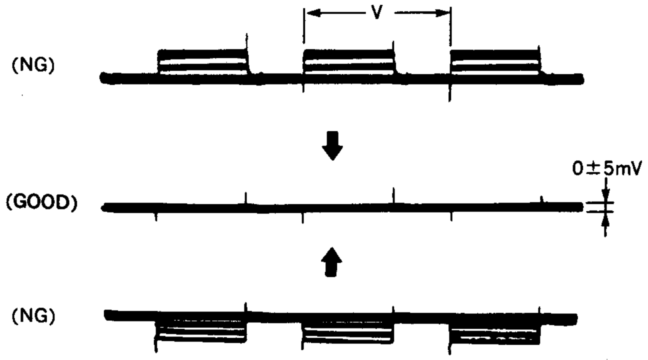


Fig. 9-17.

(2) Y_2 Gain Adjustment (VC-99 Board)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin(A5)(VAP OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	06 (Y_2 GAIN)
Specified value	0 ± 5mV

[Preparation]

1) Short the chickpoint array pin(B5)(VAP SLICE) with GND.

[Adjustment Method]

1) Select the adjustment page F by the adjustment remote control.
2) Select the adjustment address 0F by the adjustment remote control and preset the adjustment data to be 00. (VAP GAIN : MAX)
3) Select the adjustment address 06 by the adjustment remote control.
4) Change the adjustment data and set the $(Y_1-\frac{Y_0+Y_2}{2})$ waveform to be a straight line. (There should not be difference.)
5) Select the adjustment address 0F by the adjustment remote control and set the adjustment data to be 7A.
6) Change the adjustment address in order to store the adjustment data.
7) Open the checkpoint array pin(B5) .

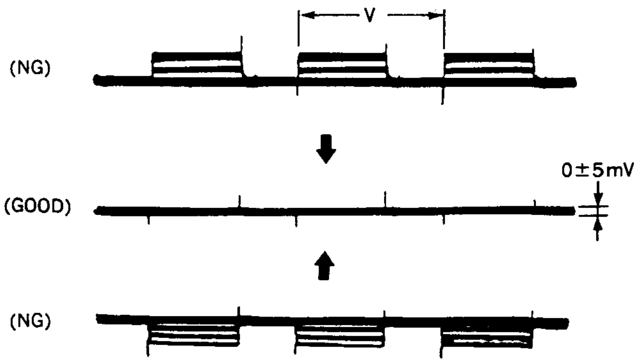


Fig. 9-18.

(3) C_1 Gain Adjustment

Object	Color bar chart standard picture frame
Measurement point	VIDEO OUT terminal
Measuring instrument	Vectorscope
Adjustment page	F
Adjustment address	03 (C_1 GAIN)
Specified value	Minimize the divided bright point. (Cyan, green ···Within 2.0 mm Magenta ······ Within 1.0 mm Others ········· Within 0.5 mm)

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 03 by the adjustment remote control.
2) Change the adjustment data to coincide each color bright point.
3) Change the adjustment address in order to store the adjustment data.

Specified Values When Vectorscope is used.

(Specified value :Cyan, Green. . . . Within 2.0mm
Magenta . . . . . . Within 1.0mm
Others . . . . Within 0.5mm)

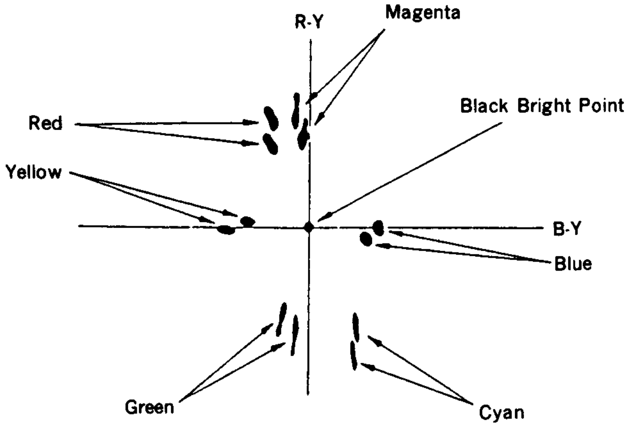


Fig. 9-19.

9-3-12. Y_H Level Adjustment (VC-99 Board)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin Ⓐ6 (TP)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	08 (Y_H GAIN)
Specified value	0±5mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 08 by the adjustment remote control.
2) Change the adjustment data by the adjustment remote control in order that the output is a straght line. (There should not be difference : 0+5mV)
3) Change the adjustment address in order to store the adjustment data.

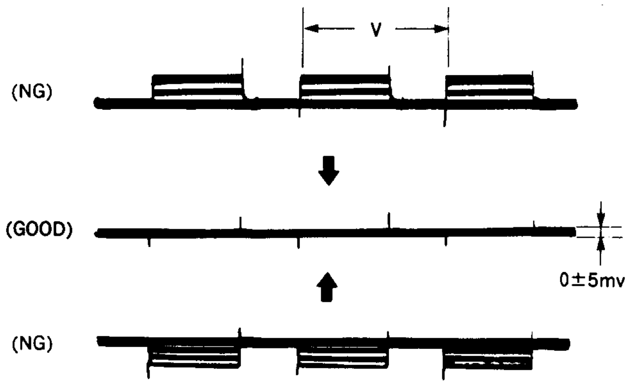


Fig. 9-20.

9-3-13. Chroma Level Adjustment (VC-99 Borad)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin(A7)(WB-G)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	11 (C LEVEL)
Specified value	320±20mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 11 with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to adjust the White level to 320±20 mV.
3) Change the adjustment address in order to store the adjustment data.

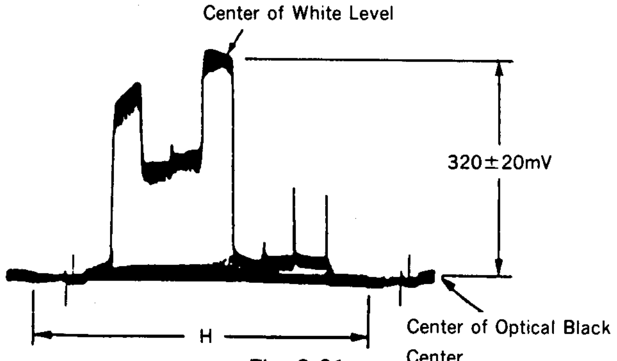


Fig. 9-21.

9-3-14. Sync. Level Adjustment (VC-99 Board)

Object	All black (Cover the lens with a black cap.)
Measurement point	CN307 pin① (Y OUT) or checkpoint array pin(A8)(CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	16 (SYNC LEVEL)
Specified value	150±5mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 16 with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to adjust the sync. level to 150±5mV.
3) Change the adjustment address in order to store the adjustment data.

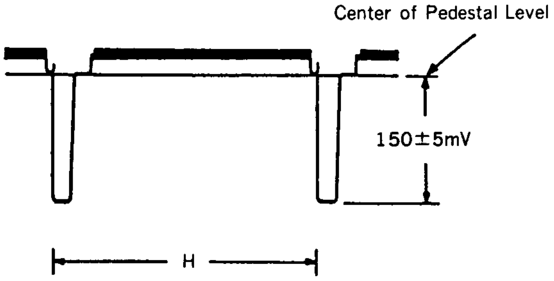


Fig. 9-22.

9-3-15. Setup Adjustment (VC-99 Board)

Object	All black (Cover the lens with a black cap.)
Measurement point	CN307 pin ① (Y OUT) or checkpoint array pin (A8) (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	10 (SET UP) 18 (MAX GAIN)
Specified value	15±5mV

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjustment address 18 with the adjustment remote control, make note of the adjustment data of this address (data F), and then, set the adjustment data to 00.
3) Select the adjustment address 10 with the adjustment remote control.
4) Change the adjustment data with the adjustment remote control to adjust the setup level to 15±5mV.
5) Select the adjustment address 18 and enter to the adjustment data F.
6) Change the adjustment address in order to store the adjustment data.

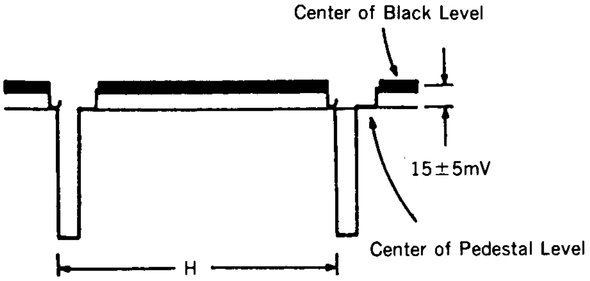


Fig. 9-23.

9-3-16. White Clip Adjustment (VC-99 Board)

Object	Color bar chart standard picture frame
Measurement point	CN307 pin ① (Y OUT) or checkpoint array pin (A8) (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	15 (WC) 0E (Y LEVEL)
Specified value	420±10mV

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjustment address 0E with the adjustment remote control, make note of the adjustment data of this address (data G), and then, set the adjustment data to FF.
3) Set the adjustment address to 15 with the adjustment remote control.
4) Change the adjustment data with the adjustment remote control to adjust the white clip level to 420±10mV.
5) Select the adjustment address 0E and enter to adjustment data G.
6) Change the adjustment address in order to store the adjustment data.
7) Make Y level adjustment as described in 9-3-17.

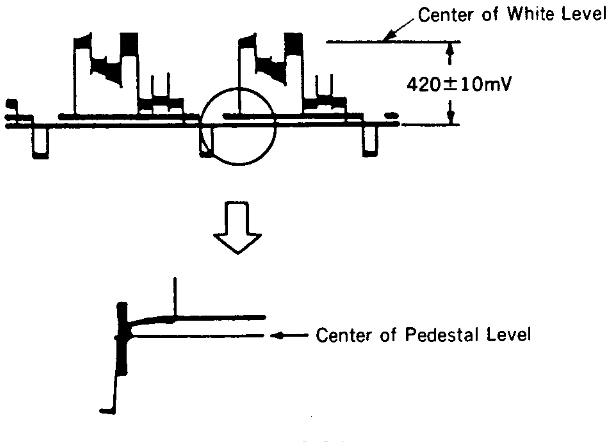


Fig. 9-24.

9-3-17. Y Level Adjustment (VC-99 Board)

Object	Color bar chart standard picture frame
Measurement point	CN307 pin ① (Y OUT) or checkpoint array pin (A8) (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	0E (Y LEVEL)
Specified value	330±5mV

[Adjustment Method]

1) Check that the specified value in "9-3-16 White Clip Adjustment" is met.
2) Select the adjustment page F and the adjustment address 0E with the adjustment remote control.
3) Change the adjustment data with the adjustment remote control and adjust the Y signal level to 330±5mV.
4) Change the adjustment address in order to store the adjusment data.

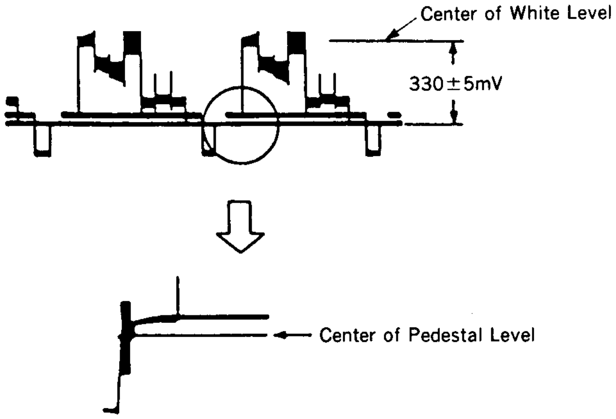


Fig. 9-25.

9-3-18. H Aperture Adjustment (VC-99 Board)

Object	Color bar chart standard picture frame
Measurement point	CN307 pin ① (Y OUT) or checkpoint array pin (A8) (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	0D (SHP LEVEL)
Specified value	40±5mV

[Adjustment Method]

1) Turn the focusing ring to maximize the aperture level (waveform peak).
2) Select the adjustment page F and the adjustment address 0D with the adjustment remote control.
3) Change the adjustment data with the adjustment remote control to set the aperture level (lower peak between "green" and "white") to a point 40±5mV above the pedestal level.
4) Change the adjustment address in order to store the adjustment data.

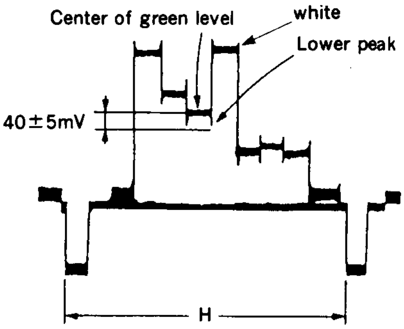


Fig. 9-26.

9-3-19. Max. Gain Adjustment (VC-99 Board)

Object	Color bar chart standard picture frame
Filter	ND filter: 2.6 (0.3+0.4+0.9+1.0)
Measurement point	CN307 pin① (Y OUT) or checkpoint array pin Ⓐ8 (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	18 (MAX GAIN)
Specified value	150±5mV

[Adjustment Method]

1) Cover the lens with the ND filter 2.6 (0.3+0.4+0.9+1.0).
2) Select the adjustment page F and the adjustment address 18 with the adjustment remote control.
3) Change the adjustment address with the adjustment remote control to adjust the Y signal level to 150±5mV.
4) Change the adjustment address in order to store the adjustment data.

Note : Although the ND filter is combined by using 4 pcs, if your ND filter is combined by using 3 pcs or less, resulting in 2.6, this combination should be available.

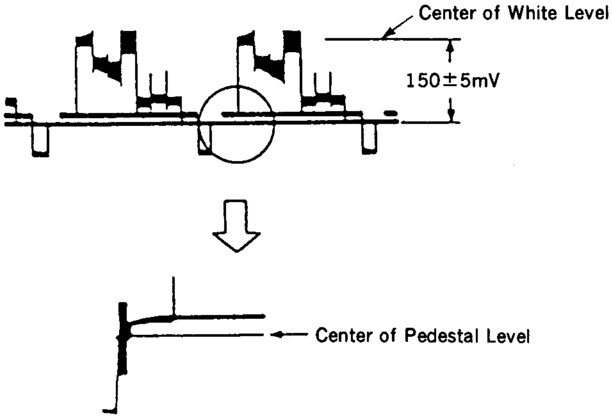


Fig. 9-27.

9-3-20. Burst Level Adjustment (VC-99 Board)

Object	All black (Cover the lens with a black cap.)
Measurement point	CN307 pin ③ (C OUT) or checkpoint array pin A10 (CAM C)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	17 (BURST LEVEL)
Specified value	150±5mVp-p

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 17 with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to adjust the burst level to 150±5mVp-p.
3) Change the adjustment address in order to store the adjustment data.

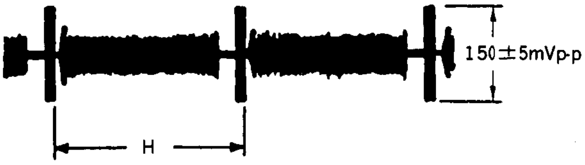


Fig. 9-28.

9-3-21. Standard AE Level Adjustment (AF-86 Board)

Object	Color bar chart standard picture frame, All black (Cover with a black cap)
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig
Adjustment page	F
Adjustment address	60 (IRIS REF-NOR) 8C 61 (IRIS REF-PO) 62 (IRIS REF-SP)
Specified value	$(D_{60}-D_{8C}) > 24$

[Adjustment Method]

1) Set the adjustment page F with the adjustment remote control.
2) Set the adjustment address EB and the adjustment data 13 with the adjustment remote control.
3) Change the adjustment address 60.
4) Input the value of the AF microcomputer data reader jig to the adjustment address 60. (This adjustment data of the adjustment address is set to D_{60})
5) Make all black. (Cover with a black cap)
6) Input the value of the AF microcomputer data reader jig to the adjustment address 8C. (This adjustment data of the adjustment address 8C is set to D_{8C})
7) Check that it is $(D_{60}-D_{8C}) > 24$. When the value of $(D_{60}-D_{8C})$ is between 21 and 24, set the adjustment address each 76 and 71 and the adjustment data 05 from 06.
8) Input the value of $(D_{60}-08)$ to the adjustment address 61 and 62.

Example)

The adjustment data D_{60} of the adjustment address 60		The input value of the adjustment address 61 and 62
5A	⟶	52
5B	⟶	53
5C	⟶	54

9) Set the adjustment address EB and the adjustment data 00 with the adjustment remote control.
10) Change the adjustment address in order to store the adjustment data.

9-3-22 (A). Pre-white Balance Adjustment (With Vectorscope)

Object	All white pattern
Measurement point	VIDEO OUT terminal of the video block
Measuring instrument	Vectorscope
Adjustment page	F
Adjustment address	05 (R GAIN) 04 (B GAIN)
Specified value	The center of a white bright point must be within a circle of ϕ 1 mm centering around the origin

[Adjustment Method]

1) Maximize the gain of vectorscope.
2) Select the adjustment page F and the adjustment address 05 with the adjustment remote control.
3) Change the adjustment data with the adjustment remote control to coincide the white bright point with the origin.
4) Select the adjustment address 04.
5) Change the adjustment data to coincide the white bright point with the origin.
6) Repeat the steps 2) through 5).
7) Return the gain of vectorscope to CAL, and make sure that center of the bright point is located inside a circle of 1 mm diameter apart from the origin.
8) Change the adjustment address in order to store the adjustment data.

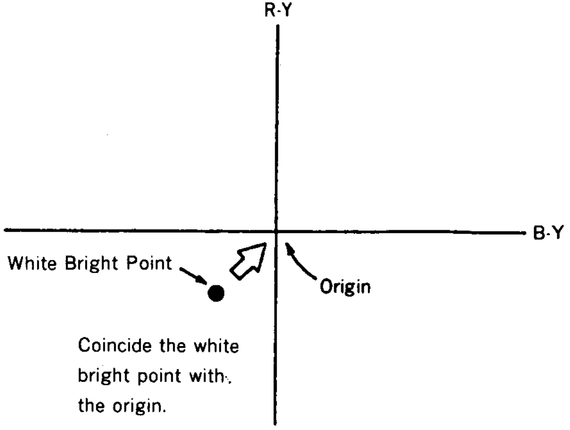


Fig. 9-29.

9-3-22 (B). Pre-white Balance Adjustment (With Oscilloscope) (VC-99 Board)

Object	All white pattern
Measurement point	CN307 pin ③ (C OUT) or checkpoint array pin(A10)(CAM C)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	05 (R GAIN) 04 (B GAIN)
Specified value	Chroma signal amplitude minimum

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 05 with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to minimize a chroma signal amplitude.
3) Select the adjustment address 04.
4) Change the adjustment data to minimize the chroma signal amplitude.
5) Repeat the steps 1) through 4).
6) Change the adjustment address in order to store the adjustment data.

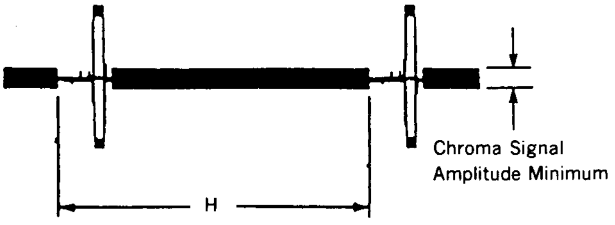


Fig. 9-30.

9-3-23. Color Reproducibility Adjustment (With Vectorscope)

Object	Color bar chart standard picture frame
Measurement point	VIDEO OUT terminal of the video block
Measuring instrument	Vectorscope
Adjustment page	F
Adjustment address	09 (R-Y GAIN) 0A (B-Y GAIN) 0B (R-Y HUE) 0C (B-Y HUE)
Specified value	All color bright points must be within a color reproduction frame.

Note : Burst level adjustment and pre-white balance adjustment must have been completed.

[Adjustment Method]

1) Set the adjustment page F with the adjustment remote control.
2) Change the adjustment data of each adjustment address with the adjustment remote control to collect all the color bright points within the color reproduction frame.
3) Change the adjustment address in order to store the adjustment data.

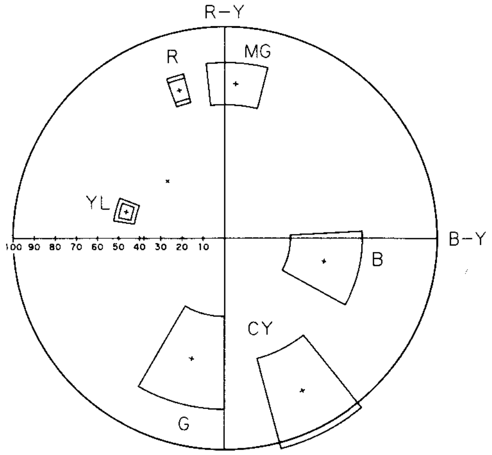


Fig. 9-31.

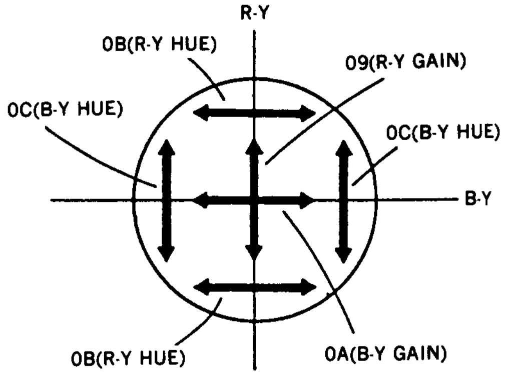


Fig. 9-32. Adjustment Addresses and Bright Point Moving Directions

9-3-24. Auto White Balance Adjustment

Note 1 : Be sure to make "preset adjustment" and "auto white balance adjustment" in that order.

(1) Preset Adjustment

Object	White pattern standard picture frame
Adjustment page	F
Adjustment address	EE (AWB MODE 1)

Note 1 : Make preset adjustment 30 seconds or more after turning on the power.

Note 2 : When redoing preset adjustment, turn off the power once, and then, turn it on again.

[Adjustment Method]

1) Turn off/on the power.
2) Obtain a picture of white pattern for over five seconds. (AF switch is turned off.)
3) Select the adjustment page F with the adjustment remote control.
4) Select the adjustment address EE by the adjustment remote control and set the adjustment data to be 01.
5) Change the adjustment address in order to store the adjustment data. (3200K data fetch 1)
6) Select the adjustment address EE by the adjustment remote control and set the adjustment data to be 23.
7) Change the adjustment address in order to store the adjustment data. (3200K data fetch 2)
8) Check that the LANC data is changed and the adjustment address 95 is selected.
9) Select the adjustment address EE by the adjustment remote control and set the adjustment data to be 00.
10) Change the adjustment address in order to store the adjustment data.
11) Make auto white balance adjustment.

(2) Auto White Balance Adjustment

Note 1 : Be sure to make this adjustment after preset adjustment.

Object	White pattern standard picture frame
Filter	Color temperature compensation filter C14 (C12+C2)
Measuring instrument	Vectorscope
Measurement point	VIDEO OUT terminal
Adjustment page	F
Adjustment address	01 (R CONT) 02 (B CONT) 98 (START R) 99 (START B) 9A (R OUT DOOR) 9B (B OUT DOOR) A0 (Ra) A1 (Rb) A2 (Rc) A3 (Ba) A4 (Bb) A5 (Bc) A6 (R/B TOP) A7 (R/B MDL) A8 (R/B BTM) A9 (B/R TOP) AA (B/R MDL) AB (B/R BTM) B0 (TOP SLP R) B8 (TOP UP) B9 (TOP DWN) BD (R DWN LMT) BE (B DWN LMT) BF (B IN TOP) C0 (B IN MAX) C1 (B OUT MIN) C2 (B OUT DWN)
Specified value	The white and black bright points must coincide.

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjustment address EE (AWB MODE1) with the adjustment remote control and enter the adjustment data 10. (Set of WB DIRECT)
3) Cover the lens with the C14 filter.
4) Change the adjustment data of the adjustment addresses 01 and 02 with the adjustment remote control to coincide the white bright point with the origin.
   At this time, assume the data of the adjustment address 01 as Rc14 and that of the adjustment address 02 as Bc14.

5) Input the value on the AWB adjustment data list (Refer to page 228) from the value of Rc14 and Bc14 to each address, and then proceed to the item 16). If the value does not come under the list, caluculate the adjustment data by the calculation from item 6).

6) Make that the adjustment address 01 data of the adjustment remote control on the item 4) is C_1 and the adjustment address 02 data is C_2.

7) Convert C_1 into a decimal number to assume it as C_1', and C_2 as well as C_2'. (Refer to Table 9-4 "Hexadecimal-Decimal Conversion Table")

8) Obtain D_{9A}' anb D_{9B}' by the following formula.

$D_{9A}'=C_1'+2 \qquad D_{9B}'=C_2'+6$

9) Convert D_{9A}' and D_{9B}' into a hexadecimal number and assume its value as D_{9A} and D_{9B}. (Round fractions below a decimal number to the nearest whole number)

10) Select the adjustment address 9A and enter the adjustment data D_{9A}.

11) Select the adjustment address 9B and enter the adjustment data D_{9B}.

12) Obtain A and B in the hexadecimal numbers by the following formula, and convert them into the decimal numbers. The values are A′ and B′.

$A=5A-D_{9A}$

$B=D_{9B}-50$

13) Obtain the adjustment data of each adjustment address in the decimal numbers by the following formula.

$D_{A0}'=90-A'\times 1.12$

$D_{A1}'=D_{9A}'$

$D_{A2}'=90-A'\times 0.593$

$D_{98}'=D_{A2}'$

$D_{BE}'=B'\times 2+80$

$D_{BF}'=D_{9B}'$

$D_{C0}'=B'\times 0.84+80$

$D_{C1}'=D_{C0}'$

$D_{C2}'=B'\times 0.3+80$

$D_{A3}'=B'\times 1.34+80$

$D_{99}'=D_{A5}'$

$D_{A4}'=D_{9B}'$

$D_{A5}'=B\times 0.467+80$

$D_{BD}=90-A'\times 1.67$

14) The above items, calculate by decimal and input by hexadecimal.

15) The below items, calculate by hexadecimal and input the adjustment data to each adjustment address.

$$D_{A6}=\frac{(D_{A1}-D_{A0})\times 40}{(D_{A3}-D_{A4})}$$

$$D_{A7}=\frac{(D_{A2}-D_{A1})\times 40}{(D_{A4}-D_{A5})}$$

$$D_{A8}=\frac{(5A-D_{A2})\times 40}{(D_{A5}-50)}$$

$$D_{A9}=\frac{(D_{A3}-D_{A4})\times 10}{(D_{A1}-D_{A0})}$$

$$D_{AA}=\frac{(D_{A4}-D_{A5})\times 10}{(D_{A2}-D_{A1})}$$

$$D_{AB}=\frac{(D_{A5}-50)\times 10}{(5A-D_{A2})}$$

$$D_{B0}=D_{A9}$$

$$D_{B8}=\frac{(D_{A1}+0A)\times D_{A9}+D_{A4}\times 10}{40}$$

$$D_{B9}=\frac{(D_{A1}-11)\times D_{A9}+D_{A4}\times 10}{40}$$

16) Select the adjustment address EE and enter the adjustment data 00.

17) Change the adjustment address in order to store the adjustment data.

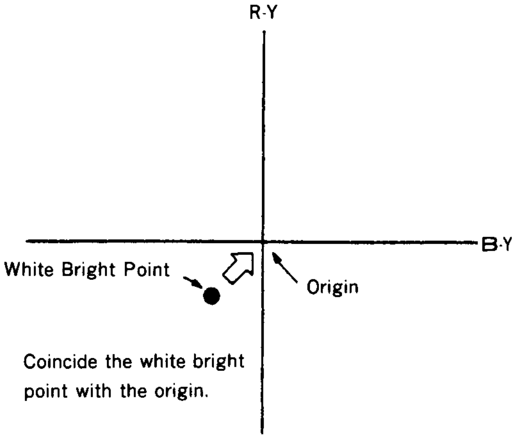


Fig. 9-33.

• AWB Adjustment Data Table

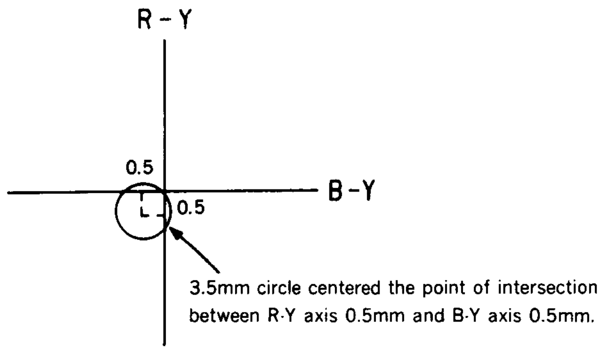
Rc14;Bc14	adr98	99	9A	9B	A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	B0	B8	B9	BD	BE	BF	C0	C1	C2
3D 78	4A	65	3F	7E	3C	3F	4A	8E	7E	65	C	1C	31	55	24	15	55	81	5D	2C	AC	7E	77	77	5E
3D 79	4A	66	3F	7F	3C	3F	4A	8F	7F	66	C	1C	2F	55	24	16	55	81	5D	2C	AE	7F	77	77	5E
3D 7A	4A	66	3F	80	3C	3F	4A	90	80	66	C	1B	2F	55	26	16	55	81	5D	2C	B0	80	78	78	5E
3D 7B	4A	67	3F	81	3C	3F	4A	92	81	67	B	1B	2D	5B	26	17	5B	88	61	2C	B2	81	79	79	5F
3D 7C	4A	67	3F	82	3C	3F	4A	93	82	67	B	1A	2D	5B	27	17	5B	88	62	2C	B4	82	7A	7A	5F
3D 7D	4A	68	3F	83	3C	3F	4A	94	83	68	B	1A	2B	5B	27	18	5B	88	62	2C	B6	83	7B	7B	5F
3D 7E	4A	68	3F	84	3C	3F	4A	96	84	68	B	19	2B	60	29	18	60	8F	66	2C	B8	84	7C	7C	60
3D 7F	4A	69	3F	85	3C	3F	4A	97	85	69	B	19	29	60	29	19	60	8F	66	2C	BA	85	7D	7D	60
3D 80	4A	69	3F	86	3C	3F	4A	98	86	69	B	18	29	60	2A	19	60	8F	67	2C	BC	86	7D	7D	60
3D 81	4A	6A	3F	87	3C	3F	4A	9A	87	6A	A	18	27	65	2A	1A	65	95	6B	2C	BE	87	7E	7E	61
3D 82	4A	6A	3F	88	3C	3F	4A	9B	88	6A	A	17	27	65	2C	1A	65	96	6B	2C	C0	88	7F	7F	61
3D 83	4A	6B	3F	89	3C	3F	4A	9C	89	6B	A	17	26	65	2C	1B	65	96	6B	2C	C2	89	80	80	61
3D 84	4A	6B	3F	8A	3C	3F	4A	9E	8A	6B	A	17	26	6B	2D	1B	6B	9C	6F	2C	C4	8A	81	81	61
3D 85	4A	6C	3F	8B	3C	3F	4A	9F	8B	6C	A	17	25	6B	2D	1C	6B	9C	6F	2C	C6	8B	82	82	62
3D 86	4A	6C	3F	8C	3C	3F	4A	A0	8C	6C	A	16	25	6B	2F	1C	6B	9D	70	2C	C8	8C	82	82	62
3D 87	4A	6C	3F	8D	3C	3F	4A	A2	8D	6C	9	15	25	70	30	1C	70	A3	74	2C	CA	8D	83	83	62
3D 88	4A	6D	3F	8E	3C	3F	4A	A3	8E	6D	9	15	23	70	30	1D	70	A3	74	2C	CC	8E	84	84	63
3D 89	4A	6D	3F	8F	3C	3F	4A	A4	8F	6D	9	15	23	70	31	1D	70	A4	74	2C	CE	8F	85	85	63
3D 8A	4A	6E	3F	90	3C	3F	4A	A6	90	6E	9	15	22	75	31	1E	75	AA	78	2C	D0	90	86	86	63
3D 8B	4A	6E	3F	91	3C	3F	4A	A7	91	6E	9	14	22	76	33	1E	75	AA	79	2C	D2	91	87	87	64
3E 78	4B	65	40	7E	3D	40	4B	8E	7E	65	C	1C	2E	55	24	16	55	82	5E	2E	AC	7E	77	77	5E
3E 79	4B	66	40	7F	3D	40	4B	8F	7F	66	C	1C	2C	55	24	17	55	82	5E	2E	AE	7F	77	77	5E
3E 7A	4B	66	40	80	3D	40	4B	90	80	66	C	1B	2C	55	26	17	55	83	5F	2E	B0	80	78	78	5E
3E 7B	4B	67	40	81	3D	40	4B	92	81	67	B	1B	2A	5B	26	19	5B	89	63	2E	B2	81	79	79	5F
3E 7C	4B	67	40	82	3D	40	4B	93	82	67	B	1A	2A	5B	27	19	5B	89	63	2E	B4	82	7A	7A	5F
3E 7D	4B	68	40	83	3D	40	4B	94	83	68	B	1A	28	5B	27	1A	5B	8A	63	2E	B6	83	7B	7B	5F
3E 7E	4B	68	40	84	3D	40	4B	96	84	68	B	19	28	60	29	1A	60	90	68	2E	B8	84	7C	7C	60
3E 7F	4B	69	40	85	3D	40	4B	97	85	69	B	19	26	60	29	1B	60	90	68	2E	BA	85	7D	7D	60
3E 80	4B	69	40	86	3D	40	4B	98	86	69	B	18	26	60	2A	1B	60	91	68	2E	BC	86	7D	7D	60
3E 81	4B	6A	40	87	3D	40	4B	9A	87	6A	A	18	25	65	2A	1C	65	97	6C	2E	BE	87	7E	7E	61
3E 82	4B	6A	40	88	3D	40	4B	9B	88	6A	A	17	25	65	2C	1C	65	97	6C	2E	C0	88	7F	7F	61
3E 83	4B	6B	40	89	3D	40	4B	9C	89	6B	A	17	24	65	2C	1D	65	97	6D	2E	C2	89	80	80	61
3E 84	4B	6B	40	8A	3D	40	4B	9E	8A	6B	A	17	24	6B	2D	1D	6B	9E	71	2E	C4	8A	81	81	61
3E 85	4B	6C	40	8B	3D	40	4B	9F	8B	6C	A	17	22	6B	2D	1E	6B	9E	71	2E	C6	8B	82	82	62
3E 86	4B	6C	40	8C	3D	40	4B	A0	8C	6C	A	16	22	6B	2F	1E	6B	9E	71	2E	C8	8C	82	82	62
3E 87	4B	6C	40	8D	3D	40	4B	A2	8D	6C	9	15	22	70	30	1E	70	A5	76	2E	CA	8D	83	83	62
3E 88	4B	6D	40	8E	3D	40	4B	A3	8E	6D	9	15	21	70	30	1F	70	A5	76	2E	CC	8E	84	84	63
3E 89	4B	6D	40	8F	3D	40	4B	A4	8F	6D	9	15	21	70	31	1F	70	A5	76	2E	CE	8F	85	85	63
3E 8A	4B	6E	40	90	3D	40	4B	A6	90	6E	9	15	20	75	31	20	75	AC	7A	2E	D0	90	86	86	63
3E 8B	4B	6E	40	91	3D	40	4B	A7	91	6E	9	14	20	75	33	20	75	AC	7A	2E	D2	91	87	87	64
3F 78	4B	65	41	7E	3E	41	4B	8E	7E	65	C	1A	2E	55	28	16	55	84	60	30	AC	7E	77	77	5E
3F 79	4B	66	41	7F	3E	41	4B	8F	7F	66	C	1A	2C	55	28	17	55	84	60	30	AE	7F	77	77	5E
3F 7A	4B	66	41	80	3E	41	4B	90	80	66	C	19	2C	55	2A	17	55	84	60	30	B0	80	78	78	5E
3F 7B	4B	67	41	81	3E	41	4B	92	81	67	B	19	2A	5B	2A	19	5B	8B	64	30	B2	81	79	79	5F
3F 7C	4B	67	41	82	3E	41	4B	93	82	67	B	18	2A	5B	2B	19	5B	8B	65	30	B4	82	7A	7A	5F
3F 7D	4B	68	41	83	3E	41	4B	94	83	68	B	18	28	5B	2B	1A	5B	8B	65	30	B6	83	7B	7B	5F
3F 7E	4B	68	41	84	3E	41	4B	96	84	68	B	17	28	60	2D	1A	60	92	69	30	B8	84	7C	7C	60
3F 7F	4B	69	41	85	3E	41	4B	97	85	69	B	17	26	60	2D	1B	60	92	69	30	BA	85	7D	7D	60
3F 80	4B	69	41	86	3E	41	4B	98	86	69	B	16	26	60	2E	1B	60	92	6A	30	BC	86	7D	7D	60
3F 81	4B	6A	41	87	3E	41	4B	9A	87	6A	A	16	25	65	2E	1C	65	99	6E	30	BE	87	7E	7E	61
3F 82	4B	6A	41	88	3E	41	4B	9B	88	6A	A	15	25	65	30	1C	65	99	6E	30	C0	88	7F	7F	61
3F 83	4B	6B	41	89	3E	41	4B	9C	89	6B	A	15	24	65	30	1D	65	99	6E	30	C2	89	80	80	61
3F 84	4B	6B	41	8A	3E	41	4B	9E	8A	6B	A	15	24	6B	32	1D	6B	A0	73	30	C4	8A	81	81	61
3F 85	4B	6C	41	8B	3E	41	4B	9F	8B	6C	A	15	22	6B	32	1E	6B	A0	73	30	C6	8B	82	82	62

9-3-25. Outdoor White Balance Check

Object	White pattern standard picture frame
Filter	Color temperature compensation filter C14 (C12+C2)
Measurement point	VIDEO OUT terminal of the video block
Measuring instrument	Vectorscope
Specified value	Refer to Fig 9-34.

[Check Method]

1) Press the White Balance button to select the outdoor white balance mode. (A mark "☼" appears on the EVF screen or monitor screen (when the data screen is turned on)).
2) Check that the center of the white bright point is within the circumference shown in Fig. 9-34.



3.5mm circle centered the point of intersection between R-Y axis 0.5mm and B-Y axis 0.5mm.

Fig. 9-34.

9-3-26. Focus Motor Speed Adjustment (AF-86 Board)

Object	Optional
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig
Adjustment page	F
Adjustment address	5D (MAN F SPEED) 4A (ADJ PWM) 2B (M SPEED-B) 2C (M SPEED-C) 2D (M SPEED-D) 2A (M SPEED-A) 2E (M SPEED-E) 5C (MAN PWM SPEED)

[Adjustment Method]

1) Set the auto mode with the FOCUS button.
2) Select the adjustment page F with the adjustment remote control.
3) Select the adjustment address EB with the adjustment remote control and set the adjustment data to F5.
4) Balance the adjustment data at the adjustment address 5D so that the data indicated by the AF microcomputer data reader jig is changed from 0D to 0E after two seconds have elapsed.
5) Balance the adjustment data at the adjustment address 4A so that the data indicated by the AF microcomputer data reader jig is between 4B and 4F. (This adjustment data is assumed as LSP.)
6) Convert LSP into decimal data and assume it as LSP'.
7) Perform the following calculations in decimal form. Round down the results and convert them into hexadecimal data. Then input the data into the adjustment data at the respective adjustment addresses.

   adjustment address 2B : $LSP'+\frac{255-LSP'}{0.81}\times 0.05$

   adjustment address 2C : $LSP'+\frac{255-LSP'}{0.81}\times 0.13$

   adjustment address 2D : $LSP'+\frac{255-LSP'}{0.81}\times 0.31$
8) Input the adjustment data as follows:

   adjustment address 2A : LSP (the data of adjustment address 4A)

   adjustment address 2E : FF

   adjustment address 5C : the data of adjustment address 2D
9) Select the adjustment address EB with the adjustment remote control and set the adjustment data 00.
10) Change the adjustment address in order to store the adjustment data.

9-3-27. AF Adjustment

[Preparation]

1) Set the distance from the pattern box to the lens reference mark (Φ) to 1.5m. Then, place the zoom lever in the color bar chart standard picture frame position.

(1)AF Data Input (AF-86 Board)

Object	Siemens star chart standard picture frame, All black (Cover with a black cap), White pattern standard picture frame.
Filter	ND filter: 1.5 (0.1+0.4+1.0)
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig
Adjustment page	F
Adjustment address	27 (AGC HD) 26 (AGC MD) 30 (PA SET) 28 (LD-B) 29 (HD-B) 46 (AGC CONT W) 45 (AGC CONT B)

[Adjustment Method]

1) Place the system in the siemens star chart standard picture frame state.
2) Set the manual mode with the FOCUS button.
3) Attach the ND filter 1.5 (0.1+0.4+1.0) to the front of the lens.
4) Set the focus ring to the 1.2m and set the auto mode with the FOCUS button.
5) After 2.0 seconds, confirm that the picture of siemens star is taken clearly. Set the manual mode with the FOCUS button.
6) Detach the ND filter.
7) Select the adjustment page F with the adjustment remote control.
8) Select the adjustment address EB with the adjustment remote control and set the adjustment data to EF.
9) Change the adjustment address in order to store the adjustment data.
10) Wait until the data indicated by the AF microcomputer data reader jig data is stable (for about 1 second). Change the adjustment data at the adjustment address 27, then balance so that the data indicated by the AF microcomputer data reader jig is between B5 and BD.
11) Select the adjustment address EB with the adjustment remote control and set the adjustment data to ED.
12) Change the adjustment address in order to store the adjustment data.
13) Change the adjustment data at the adjustment address 26. Balance so that the data indicated by the AF microcomputer data reader jig is between E0 and ED.
14) Input the current readout of the AF microcomputer data reader jig into the adjustment data at the adjustment address 30.
15) Cover the lens with black cap.
16) Select the adjustment address EB with the adjustment remote control and set the adjustment data to F1.
17) Change the adjustment address in order to store the adjustment data.
18) If the readout of the AF microcomputer data reader jig is 19 or more, input it into the adjustment data at the adjustment address 28.
    If it is less than 18, input 19.
19) Select the adjustment address EB with the adjustment remote control and set the adjustment data to EF.
20) Change the adjustment address in order to store the adjustment data.
21) If the readout of the AF microcomputer data reader jig is 08 or more, input it into the adjustment data at the adjustment address 29.
    If it is 07 or less, input 08.
22) Select the adjustment address EB with adjustment remote control and set the adjustment data to 0B.
23) Change the adjustment address in order to store the adjustment data.
24) Input the current readout of the AF microcomputer data reader jig into the adjustment data at the adjustment address 46.
25) Detach the black cap and set the white pattern standard picture frame.
26) Input the current readout of the AF microcomputer data reader jig into the adjustment data at the adjustment address 45.
27) Select the adjustment address EB with adjustment remote control and set the adjustment data to 00.
28) Change the adjustment address in order to store the adjustment data.

Rc14	Bc14	adr98	99	9A	9B	A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	B0	B8	B9	BD	BE	BF	C0	C1	C2
3F	86	4B	6C	41	8C	3E	41	4B	A0	8C	6C	A	14	22	6B	33	1E	6B	A0	73	30	C8	8C	82	82	62
3F	87	4B	6C	41	8D	3E	41	4B	A2	8D	6C	9	13	22	70	35	1E	70	A7	77	30	CA	8D	83	83	62
3F	88	4B	6D	41	8E	3E	41	4B	A3	8E	6D	9	13	21	70	35	1F	70	A7	78	30	CC	8E	84	84	63
3F	89	4B	6D	41	8F	3E	41	4B	A4	8F	6D	9	13	21	70	36	1F	70	A7	78	30	CE	8F	85	85	63
3F	8A	4B	6E	41	90	3E	41	4B	A6	90	6E	9	13	20	75	36	20	75	AE	7C	30	D0	90	86	86	63
3F	8B	4B	6E	41	91	3E	41	4B	A7	91	6E	9	12	20	75	38	20	75	AE	7C	30	D2	91	87	87	64
40	78	4C	65	42	7E	3F	42	4C	8E	7E	65	C	1A	2B	55	28	18	55	85	61	31	AC	7E	77	77	5E
40	79	4C	66	42	7F	3F	42	4C	8F	7F	66	C	1A	29	55	28	19	55	85	61	31	AE	7F	77	77	5E
40	7A	4C	66	42	80	3F	42	4C	90	80	66	C	19	29	55	2A	19	55	85	61	31	B0	80	78	78	5E
40	7B	4C	67	42	81	3F	42	4C	92	81	67	B	19	27	5B	2A	1A	5B	8C	66	31	B2	81	79	79	5F
40	7C	4C	67	42	82	3F	42	4C	93	82	67	B	18	27	5B	2B	1A	5B	8C	66	31	B4	82	7A	7A	5F
40	7D	4C	68	42	83	3F	42	4C	94	83	68	B	18	25	5B	2D	1B	5B	8C	66	31	B6	83	7B	7B	5F
40	7E	4C	68	42	84	3F	42	4C	96	84	68	B	17	25	60	2D	1B	60	93	6B	31	B8	84	7C	7C	60
40	7F	4C	69	42	85	3F	42	4C	97	85	69	B	17	24	60	2D	1D	60	93	6B	31	BA	85	7D	7D	60
40	80	4C	69	42	86	3F	42	4C	98	86	69	B	16	24	60	2E	1D	60	94	6B	31	BC	86	7D	7D	60
40	81	4C	6A	42	87	3F	42	4C	9A	87	6A	A	16	22	65	2E	1E	65	9A	6F	31	BE	87	7E	7E	61
40	82	4C	6A	42	88	3F	42	4C	9B	88	6A	A	15	22	65	30	1E	65	9A	70	31	C0	88	7F	7F	61
40	83	4C	6B	42	89	3F	42	4C	9C	89	6B	A	15	21	65	30	1F	65	9B	70	31	C2	89	80	80	61
40	84	4C	6B	42	8A	3F	42	4C	9E	8A	6B	A	15	21	6B	32	1F	6B	A1	74	31	C4	8A	81	81	61
40	85	4C	6C	42	8B	3F	42	4C	9F	8B	6C	A	15	20	6B	32	20	6B	A1	74	31	C6	8B	82	82	62
40	86	4C	6C	42	8C	3F	42	4C	A0	8C	6C	A	14	20	6B	33	20	6B	A2	75	31	C8	8C	82	82	62
40	87	4C	6C	42	8D	3F	42	4C	A2	8D	6C	9	13	20	70	35	20	70	A8	79	31	CA	8D	83	83	62
40	88	4C	6D	42	8E	3F	42	4C	A3	8E	6D	9	13	1F	70	35	21	70	A9	79	31	CC	8E	84	84	63
40	89	4C	6D	42	8F	3F	42	4C	A4	8F	6D	9	13	1F	70	36	21	70	A9	7A	31	CE	8F	85	85	63
40	8A	4C	6E	42	90	3F	42	4C	A6	90	6E	9	13	1E	75	36	22	75	AF	7E	31	D0	90	86	86	63
40	8B	4C	6E	42	91	3F	42	4C	A7	91	6E	9	12	1E	75	38	22	75	B0	7E	31	D2	91	87	87	64
41	78	4C	65	43	7E	40	43	4C	8E	7E	65	C	17	2B	55	2C	18	55	86	62	33	AC	7E	77	77	5E
41	79	4C	66	43	7F	40	43	4C	8F	7F	66	C	17	29	55	2C	19	55	86	62	33	AE	7F	77	77	5E
41	7A	4C	66	43	80	40	43	4C	90	80	66	C	16	29	55	2E	19	55	87	63	33	B0	80	78	78	5E
41	7B	4C	67	43	81	40	43	4C	92	81	67	B	16	27	5B	2E	1A	5B	8D	67	33	B2	81	79	79	5F
41	7C	4C	67	43	82	40	43	4C	93	82	67	B	15	27	5B	30	1A	5B	8E	67	33	B4	82	7A	7A	5F
41	7D	4C	68	43	83	40	43	4C	94	83	68	B	15	25	5B	30	1B	5B	8E	68	33	B6	83	7B	7B	5F
41	7E	4C	68	43	84	40	43	4C	96	84	68	B	15	25	60	32	1B	60	95	6C	33	B8	84	7C	7C	60
41	7F	4C	69	43	85	40	43	4C	97	85	69	B	15	24	60	32	1D	60	95	6C	33	BA	85	7D	7D	60
41	80	4C	69	43	86	40	43	4C	98	86	69	B	14	24	60	34	1D	60	95	6D	33	BC	86	7D	7D	60
41	81	4C	6A	43	87	40	43	4C	9A	87	6A	A	14	22	65	34	1E	65	9C	71	33	BE	87	7E	7E	61
41	82	4C	6A	43	88	40	43	4C	9B	88	6A	A	13	22	65	35	1E	65	9C	71	33	C0	88	7F	7F	61
41	83	4C	6B	43	89	40	43	4C	9C	89	6B	A	13	21	65	35	1F	65	9C	71	33	C2	89	80	80	61
41	84	4C	6B	43	8A	40	43	4C	9E	8A	6B	A	13	21	6B	37	1F	6B	A3	76	33	C4	8A	81	81	61
41	85	4C	6C	43	8B	40	43	4C	9F	8B	6C	A	13	20	6B	37	20	6B	A3	76	33	C6	8B	82	82	62
41	86	4C	6C	43	8C	40	43	4C	A0	8C	6C	A	12	20	6B	39	20	6B	A3	76	33	C8	8C	82	82	62
41	87	4C	6C	43	8D	40	43	4C	A2	8D	6C	9	11	20	70	3B	20	70	AA	7B	33	CA	8D	83	83	62
41	88	4C	6D	43	8E	40	43	4C	A3	8E	6D	9	11	1F	70	3B	21	70	AA	7B	33	CC	8E	84	84	63
41	89	4C	6D	43	8F	40	43	4C	A4	8F	6D	9	11	1F	70	3C	21	70	AB	7B	33	CE	8F	85	85	63
41	8A	4C	6E	43	90	40	43	4C	A6	90	6E	9	11	1E	75	3C	22	75	B1	80	33	D0	90	86	86	63
41	8B	4C	6E	43	91	40	43	4C	A7	91	6E	9	10	1E	75	3E	22	75	B1	80	33	D2	91	87	87	64
42	78	4D	65	44	7E	41	44	4D	8E	7E	65	C	17	28	55	2C	1A	55	88	64	35	AC	7E	77	77	5E
42	79	4D	66	44	7F	41	44	4D	8F	7F	66	C	17	26	55	2C	1B	55	88	64	35	AE	7F	77	77	5E
42	7A	4D	66	44	80	41	44	4D	90	80	66	C	16	26	55	2E	1B	55	88	64	35	B0	80	78	78	5E
42	7B	4D	67	44	81	41	44	4D	92	81	67	B	16	24	5B	2E	1C	5B	8F	69	35	B2	81	79	79	5F
42	7C	4D	67	44	82	41	44	4D	93	82	67	B	15	24	5B	30	1C	5B	8F	69	35	B4	82	7A	7A	5F
42	7D	4D	68	44	83	41	44	4D	94	83	68	B	15	23	5B	30	1E	5B	8F	69	35	B6	83	7B	7B	5F
42	7E	4D	68	44	84	41	44	4D	96	84	68	B	15	23	60	32	1E	60	96	6E	35	B8	84	7C	7C	60
42	7F	4D	69	44	85	41	44	4D	97	85	69	B	15	21	60	32	1F	60	96	6E	35	BA	85	7D	7D	60

Rc14;Bc14		adr98	99	9A	9B	A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	B0	B8	B9	BD	BE	BF	C0	C1	C2
42	80	4D	69	44	86	41	44	4D	98	86	69	B	14	21	60	34	1F	60	97	6E	35	BC	86	7D	7D	60
42	81	4D	6A	44	87	41	44	4D	9A	87	6A	A	14	20	65	34	20	65	9D	73	35	BE	87	7E	7E	61
42	82	4D	6A	44	88	41	44	4D	9B	88	6A	A	13	20	65	35	20	65	9E	73	35	C0	88	7F	7F	61
42	83	4D	6B	44	89	41	44	4D	9C	89	6B	A	13	1F	65	35	21	65	9E	73	35	C2	89	80	80	61
42	84	4D	6B	44	8A	41	44	4D	9E	8A	6B	A	13	1F	6B	37	21	6B	A5	78	35	C4	8A	81	81	61
42	85	4D	6C	44	8B	41	44	4D	9F	8B	6C	A	13	1E	6B	37	22	6B	A5	78	35	C6	8B	82	82	62
42	86	4D	6C	44	8C	41	44	4D	A0	8C	6C	A	12	1E	6B	39	22	6B	A5	78	35	C8	8C	82	82	62
42	87	4D	6C	44	8D	41	44	4D	A2	8D	6C	9	11	1E	70	3B	22	70	AC	7D	35	CA	8D	83	83	62
42	88	4D	6D	44	8E	41	44	4D	A3	8E	6D	9	11	1D	70	3B	24	70	AC	7D	35	CC	8E	84	84	63
42	89	4D	6D	44	8F	41	44	4D	A4	8F	6D	9	11	1D	70	3C	24	70	AC	7D	35	CE	8F	85	85	63
42	8A	4D	6E	44	90	41	44	4D	A6	90	6E	9	11	1C	75	3C	25	75	B3	82	35	D0	90	86	86	63
42	8B	4D	6E	44	91	41	44	4D	A7	91	6E	9	10	1C	75	3E	25	75	B3	82	35	D2	91	87	87	64
43	78	4E	65	45	7E	42	45	4E	8E	7E	65	C	17	25	55	2C	1C	55	89	65	36	AC	7E	77	77	5E
43	79	4E	66	45	7F	42	45	4E	8F	7F	66	C	17	23	55	2C	1D	55	89	65	36	AE	7F	77	77	5E
43	7A	4E	66	45	80	42	45	4E	90	80	66	C	16	23	55	2E	1D	55	89	65	36	B0	80	78	78	5E
43	7B	4E	67	45	81	42	45	4E	92	81	67	B	16	21	5B	2E	1F	5B	90	6A	36	B2	81	79	79	5F
43	7C	4E	67	45	82	42	45	4E	93	82	67	B	15	21	5B	30	1F	5B	90	6A	36	B4	82	7A	7A	5F
43	7D	4E	68	45	83	42	45	4E	94	83	68	B	15	20	5B	30	20	5B	91	6A	36	B6	83	7B	7B	5F
43	7E	4E	68	45	84	42	45	4E	96	84	68	B	15	20	60	32	20	60	98	6F	36	B8	84	7C	7C	60
43	7F	4E	69	45	85	42	45	4E	97	85	69	B	15	1F	60	32	21	60	98	6F	36	BA	85	7D	7D	60
43	80	4E	69	45	86	42	45	4E	98	86	69	B	14	1F	60	34	21	60	98	70	36	BC	86	7D	7D	60
43	81	4E	6A	45	87	42	45	4E	9A	87	6A	A	14	1E	65	34	23	65	9F	74	36	BE	87	7E	7E	61
43	82	4E	6A	45	88	42	45	4E	9B	88	6A	A	13	1E	65	35	23	65	9F	74	36	C0	88	7F	7F	61
43	83	4E	6B	45	89	42	45	4E	9C	89	6B	A	13	1C	65	35	24	65	9F	75	36	C2	89	80	80	61
43	84	4E	6B	45	8A	42	45	4E	9E	8A	6B	A	13	1C	6B	37	24	6B	A6	79	36	C4	8A	81	81	61
43	85	4E	6C	45	8B	42	45	4E	9F	8B	6C	A	13	1B	6B	37	25	6B	A6	79	36	C6	8B	82	82	62
43	86	4E	6C	45	8C	42	45	4E	A0	8C	6C	A	12	1B	6B	39	25	6B	A7	7A	36	C8	8C	82	82	62
43	87	4E	6C	45	8D	42	45	4E	A2	8D	6C	9	11	1B	70	3B	25	70	AE	7E	36	CA	8D	83	83	62
43	88	4E	6D	45	8E	42	45	4E	A3	8E	6D	9	11	1A	70	3B	27	70	AE	7F	36	CC	8E	84	84	63
43	89	4E	6D	45	8F	42	45	4E	A4	8F	6D	9	11	1A	70	3C	27	70	AE	7F	36	CE	8F	85	85	63
43	8A	4E	6E	45	90	42	45	4E	A6	90	6E	9	11	1A	75	3C	28	75	B5	83	36	D0	90	86	86	63
43	8B	4E	6E	45	91	42	45	4E	A7	91	6E	9	10	1A	75	3E	28	76	B5	84	36	D2	91	87	87	64
44	78	4E	65	46	7E	44	46	4E	8E	7E	65	8	14	25	80	32	1C	80	C0	8A	38	AC	7E	77	77	5E
44	79	4E	66	46	7F	44	46	4E	8F	7F	66	8	14	23	80	32	1D	80	C0	8A	38	AE	7F	77	77	5E
44	7A	4E	66	46	80	44	46	4E	90	80	66	8	14	23	80	34	1D	80	C0	8A	38	B0	80	78	78	5E
44	7B	4E	67	46	81	44	46	4E	92	81	67	8	14	21	88	34	1F	88	CA	91	38	B2	81	79	79	5F
44	7C	4E	67	46	82	44	46	4E	93	82	67	8	13	21	88	36	1F	88	CB	91	38	B4	82	7A	7A	5F
44	7D	4E	68	46	83	44	46	4E	94	83	68	8	13	20	88	36	20	88	CB	91	38	B6	83	7B	7B	5F
44	7E	4E	68	46	84	44	46	4E	96	84	68	7	12	20	90	38	20	90	D5	98	38	B8	84	7C	7C	60
44	7F	4E	69	46	85	44	46	4E	97	85	69	7	12	1F	90	38	21	90	D5	99	38	BA	85	7D	7D	60
44	80	4E	69	46	86	44	46	4E	98	86	69	7	12	1F	90	3A	21	90	D6	99	38	BC	86	7D	7D	60
44	81	4E	6A	46	87	44	46	4E	9A	87	6A	7	12	1E	98	3A	23	98	E0	A0	38	BE	87	7E	7E	61
44	82	4E	6A	46	88	44	46	4E	9B	88	6A	7	11	1E	98	3C	23	98	E0	A0	38	C0	88	7F	7F	61
44	83	4E	6B	46	89	44	46	4E	9C	89	6B	7	11	1C	98	3C	24	98	E0	A0	38	C2	89	80	80	61
44	84	4E	6B	46	8A	44	46	4E	9E	8A	6B	6	11	1C	A0	3E	24	A0	EB	A7	38	C4	8A	81	81	61
44	85	4E	6C	46	8B	44	46	4E	9F	8B	6C	6	11	1B	A0	3E	25	A0	EB	A7	38	C6	8B	82	82	62
44	86	4E	6C	46	8C	44	46	4E	A0	8C	6C	6	10	1B	A0	40	25	A0	EB	A8	38	C8	8C	82	82	62
44	87	4E	6C	46	8D	44	46	4E	A2	8D	6C	6	10	1B	A8	42	25	A8	F5	AE	38	CA	8D	83	83	62
44	88	4E	6D	46	8E	44	46	4E	A3	8E	6D	6	10	1A	A8	42	27	A8	F6	AF	38	CC	8E	84	84	63
44	89	4E	6D	46	8F	44	46	4E	A4	8F	6D	6	F	1A	A8	44	27	A8	F6	AF	38	CE	8F	85	85	63
44	8A	4E	6E	46	90	44	46	4E	A6	90	6E	6	F	1A	B0	44	28	B0	100	B6	38	D0	90	86	86	63
44	8B	4E	6E	46	91	44	46	4E	A7	91	6E	6	F	1A	B0	46	28	B0	100	B6	38	D2	91	87	87	64

(2)AF Evalution Value Check (AF-86 Board)

Object	Siemens star chart standard picture frame
Filter	ND filter: 1.5 (0.1+0.4+1.0)
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig
Adjustment page	F

[Checking Method]

1) Set the manual mode with the FOCUS button.
2) Attach the ND filter 1.5 (0.1+0.4+1.0) to the front of the lens.
3) Set the focus ring to the 1.2m and set the auto mode with the FOCUS button.
4) After 2.0 seconds, confirm that the picture of siemens star is taken clearly. Set the manual mode with the FOCUS mode.
5) Select the adjustment page F with the adjustment remote control.
6) Select the adjustment address EB with the adjustment remote control and set the adjustment data to EF.
7) Change the adjustment address in order to store the adjustment data.
8) Confirm that the data of the AF microcomputer data reader jig is between A3 and BD.
9) Select the adjustment address EB with the adjustment remote control and set the adjustment data to ED.
10) Change the adjustment address in order to store the adjustment data.
11) Confirm that the data of the AF microcomputer data reader jig is between D5 and ED.
12) Select the adjustment address EB with the adjustment remote control and set the adjustment data to 00.
13) Change the adjustment address in order to store the adjustment data.

(3)AF Distance Measuring Check (AF-86 Board)

Object	Siemens star chart
Filter	ND filter: 1.5 (0.1+0.4+1.0)

[Checking Methed]

1) Attach the ND filter 1.5 (0.1+0.4+1.0) to the front of the lens.
2) Set the zoom lever to the TELE end and set the manual mode with the FOCUS button.
3) Set the focus ring to the 1.2m and set the auto mode with the FOCUS button.
4) After 2.0 seconds, confirm that the picture of siemens star is taken clear. Set the manual mode with the FOCUS button.
5) Set the focus ring to the ∞ and set the auto mode with the FOCUS button.
6) After 3.0 seconds, confirm that the picture of siemens star is taken clear. Set the manual mode with the FOCUS button.

9-4. DIGITAL TITLER SYSTEM ADJUSTMENT

9-4-1. Chroma Phase/Gain Adjustment (CT-38 Board)

Mode	CAMERA Standby
Object	All Black (Cover the lens with a black cap.)
Measurement point	VIDEO OUT terminal
Measuring instrument	Vectorscope
Adjustment element	RV702
Specified value	Adjust Cy (Cyan) to the specified range. (Check that other colors are also in the specified range.)

[Adjustment Method]

1) Press the SUPERIMPOSE TITLE button (DK-15 board S950).
2) Press the COLOR/MODE button (DK-15 board S952) and select Cy(Cyan).
3) Cover the lens with a black cap.
4) Press MEMORY button (DK-15 board S953) and display the all title.
5) At this time, the specified value should be satisfied.
6) After the adjustment, make R (red), YL (yellow), G (green), MG (magenta), B (blue), and check that the specified value is satisfied.

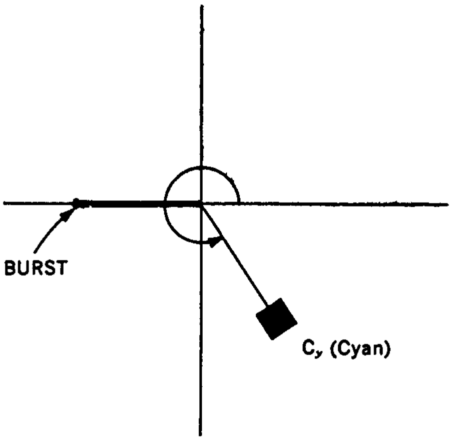


Fig. 9-35.

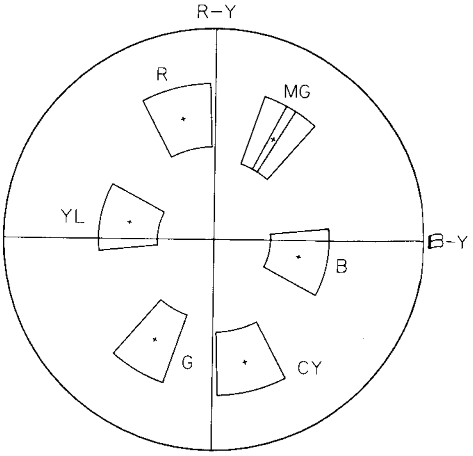


Fig. 9-36.

SECTION 10
ELECTRICAL ADJUSTMENTS (VIDEO SYSTEM)

See the adjusting part location diagram from on page 260 for the adjustment.

10-1. PREPARATION FOR ADJUSTMENT

10-1-1. Equipment Required

The following measuring instruments are needed in adjusting the VTR section.

1) Monitor TV
2) Oscilloscope Dual-trace, Bandwidth more than 10MHz with delay mode (Use a probe of 10 : 1, unless otherwise specified.)
3) Frequency counter
4) Pattern generator (with video output terminal)
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Stabilized power supply
11) Alignment tape
    For tracking adjustment (WR5-1CP)*1
      Part number : 8-967-995-07
    For video frequency characteristics adjustment (WR5-6C)*2
      Part number : 8-967-995-17
    For operation check (WR5-4CL)*3
      Part number : 8-967-995-56
    For operation check (WR5-5CSP)*4
      Part number : 8-967-995-47

Note : * 1 : WR5-1C (8-967-995-06)
* 2 : WR5-2C (8-967-995-16)
* 3 : WR5-3CL (8-967-995-36)
* 4 : WR5-3CSP (8-967-995-27)
WR5-4CSP (8-967-995-46)
} You can use these tape.

12) Adjustment remote control (RM-95 Partially remodeled product) (J-6082-053-B)
13) Extension cable (20P) J-6082-063-B (Between VA-67 board CN703 and CT-38 board CN705.)

10-1-2. Precaution for Adjustment

The video section can be also adjusted without the camera section. Remove the camera section by disconnecting the following 5 connectors.

1. VC-99 board CN305
2. DC-DC converter 2P connecter (connect the FU-100 board W991)
3. VC-99 board CN307
4. VC-99 board CN306
5. SS-136 board CN503

Remove the EVF section by disconnecting the following connector.

1. SW-183 board CN931

MIC board (MC-76 board) is not necessary for video section adjustment. Remove the MIC board by disconnecting the following connector.

1. VA-67 board CN401

Setting the switch

1. VA-67 board S201……OUT side (E Model)

10-1-3. Equipment Connection

Unless otherwise specified, adjustment is made in the VTR mode by connecting the measuring instruments as shown in the figure below.

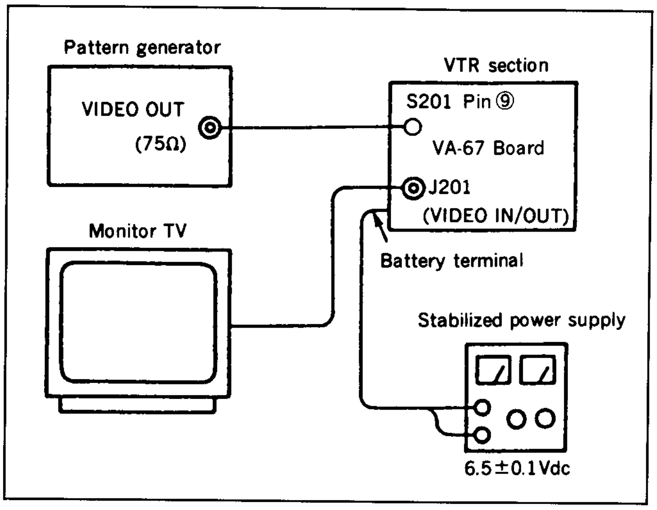


Fig. 10-1.

10-1-4. Setting up for Adjustment

Video signals output from a pattern generator are used as adjustment signals when adjusting the video section, and these video output signals should be within the required standard. Connect an oscilloscope to J201 (VIDEO IN/OUT) on theVA-67 board. Confirm that the amplitudes of video signal SYNC signals, of picture portions, and of burst signals are flat at approximately 0.3, 0.7, and 0.3V respectively, and that the level ratio of the burst signals and "red" signals are 0.30 : 0.66. Fig. 10-2 shows video signals (color burst) used in the video section adjustments.

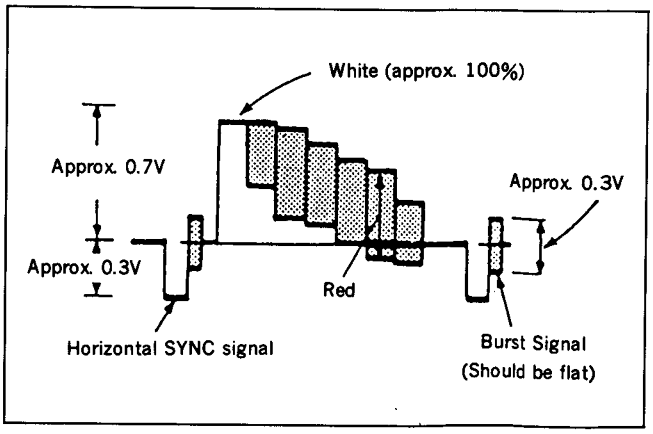
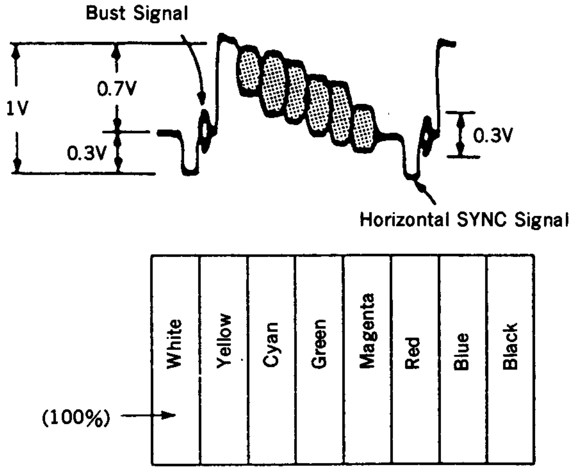


Fig. 10-2.

10-1-5. Alignment tape

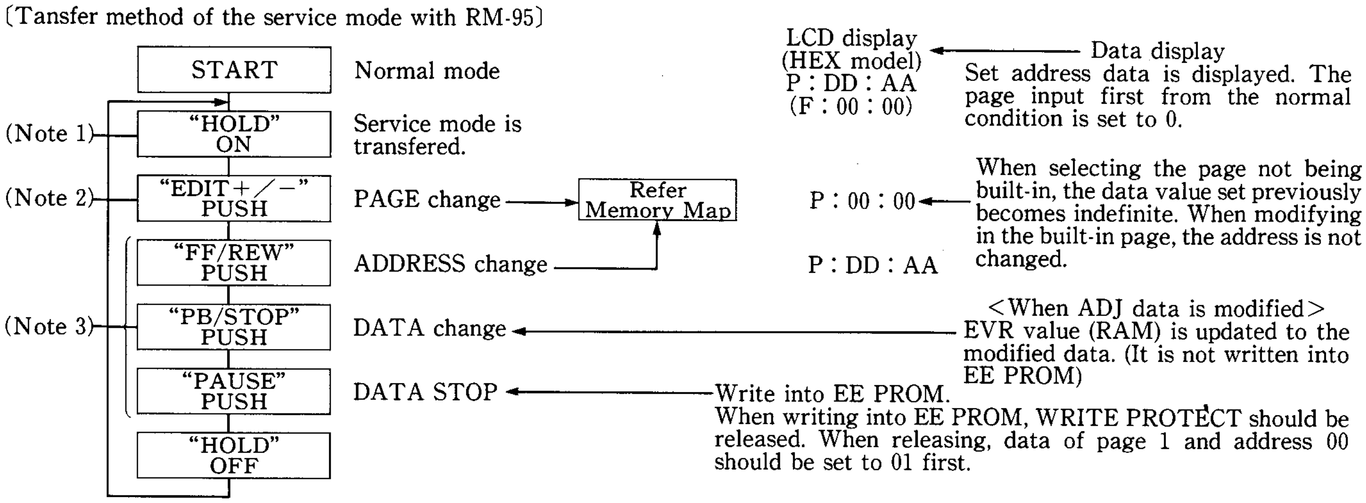
Tape	Description	Use for
Tracking (WR5-1CP)	1. Recording area PCM to Video 2. Recording content : CH2 : 1MHz linearity adjustment signal Switching position Adjustment marker (CH1 : 9MHz)	Drum linearity adjustment
Video frequency response (WR5-6C)	1. Recording area Video 2. Recording content RF sweep 0 to 10MHz 3. Marker 1, 3.58, 5.5 and 7MHz	Frequency response adjustment
Operation cheking SP mode (WR5-5CSP) LP mode (WR5-4CL) Note : PCM area is not included in WR5-4CL	1. Recording area Video 2. Recording content ■ Video area ● Video signals Color bar : 4min. Monoscope : 4min. 〔Color bars〕  Bust Signal 1V 0.7V 0.3V 0.3V Horizontal SYNC Signal White Yellow Cyan Green Magenta Red Blue Black (100%) ● Audio signal (AFM) 400Hz, 60% modulation ■ PCM area ● Audio signal (PCM) 1kHz, 4 min. Color bar 20Hz, 20 sec. 400Hz, 20 sec. Monoscope 14kHz. 20 sec.	Operation checking

10-1-6. Input/Output Level and impedance

Video input/output Phono jack
1Vp-p, 75Ω unbalance, sync negative
Audio input/output Phono jack
Input : −7.5dBs, input impedance more tham 47kilohms
Output : −7.5dBs, at output impedance less than 1kilohms
(AEP/UK MODEL : Output only
E MODEL : Input/output)

10-1-7. Service Mode

〔Tansfer method of the service mode with RM-95〕


START
Normal mode
(Note 1)
"HOLD" ON
Service mode is transfered.
(Note 2)
"EDIT+/−" PUSH
PAGE change
Refer Memory Map
"FF/REW" PUSH
ADDRESS change
(Note 3)
"PB/STOP" PUSH
DATA change
"PAUSE" PUSH
DATA STOP
"HOLD" OFF
LCD display (HEX model)
P : DD : AA
(F : 00 : 00)
Data display
P : 00 : 00
P : DD : AA

Set address data is displayed. The page input first from the normal condition is set to 0.

When selecting the page not being built-in, the data value set previously becomes indefinite. When modifying in the built-in page, the address is not changed.

<When ADJ data is modified>
EVR value (RAM) is updated to the modified data. (It is not written into EE PROM)

Write into EE PROM.
When writing into EE PROM, WRITE PROTECT should be released. When releasing, data of page 1 and address 00 should be set to 01 first.

Command name	Command function	Function Button with RM-95
Page Up	Page+ 1	Edit Search+
Page Down	Page− 1	Edit Search−
Direct Page Set	Set to direct page	Event Clear
Address Up	Address+1	Fast Forward
Address Down	Address−1	Rewind
Data Up	Data+ 1	Play Back
Data Down	Data−1	Stop
Store	Write data into EEPROM. RAM	Pause

[ADJUST, TEST MODE description]

MODE		PAGE/DATA/ADDRESS	Contents
ADJUST	Switching Position Adjustment	D : -- : 04 (high) D : -- : 05 (low)	Switching position adjustment See to page 243 for details
	Battery Down Adjustment	D : -- : 06 (Sensor value) D : -- : 07 (Set value)	Use for battery down adjustment See to page 242 for details
TEST MODE	Pass Adjustment Truck Shift	1 : 30 : 4D	Truck shift for pass adjustment Set to the data described left and set the playback mode.
	Emergency Inhibit	1 : 10 : 4D	Detection of emergency is inhibited. Even if battery is ended, power is not turned off. SP/LP is not automatically distinguished. Emergency detection except for TAPE/TOP•END is inhibited.
	Emergency Code	D : -- : 20~22 D : -- : 24~26	First emergency is displayed. Last emergency is displayed. (See to ∗ 1)
	RECOG SW Check	1 : -- : 3D 1 : -- : 3E	Mode switch position is displayed. RECOG SW ON OFF is displayed. (See to ∗ 2)
	Function SW Check	1 : -- : E8~ED	Pressing KEY is checked. (See to ∗ 3)
	Motor single check	3 : 10 : DD (Loading Ⓜ) 3 : 11 : DD (Drum Ⓜ) 3 : 12 : DD (Capstan Ⓜ)	Rotating in right direction, inverting, stopping of each motor can be separately controlled. • Loading Motor • Drum Motor (See to ∗ 4) • Capstan Motor

MODE		PAGE/DATA/ADDRESS	Contents
TEST MODE	Sensor check	3 : 21 : DD	The following sensor is input by performing A/D selecting, and the A/D selecting value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction DEW sensor. (See to ＊ 5)
	Reception contents check of wireless remote control	1 : -- : 1E and 1D	The received code contents of the remote control code can be confirmed. (See to ＊ 6)

＊1 **Emergency Code Check**
With the SENSER LANC

(The emergency code has the first emergency and last emergency. The last emergency side is changed when emergency is generated ; the first emergency side records the only code generated first.)

			First	Last	
PAGE	D	ADDRESS	20, 21	24, 25	← Emergency code
PAGE	D	ADDRESS	22	26	← Mode when emergency is generated

Displayed → Be sure to rewrite the address from 20 to 26 to data 00 after the operation.

(1) Emergency code list

Code		Emergency contents
20H,24H	21H,25H	
00	00	Normal mode
01	00	Loading Motor emergency.
02	00	Unloading, Reel emergency.
04	00	Steady, Reel emergency.
08	00	Capstan emergency.
00	01	Drum steady, FG emergency.
00	02	Drum steady, PG emergency.
00	21	Drum steady, FG emergency.
00	22	Drum steady, PG emergency.
00	41	Loading, Drum FG emergency.
00	42	Loading, Drum PG emergency.
00	81	Unloading, Drum FG emergency.
00	82	Unloading, Drum PG emergency.
——	——	Dram steady Phase emergency.

- In order to delete the contents of [the first and the last emergency], write with SENSER LANC as follows.

Page 1	Address 00	Data 01

After that, write data 00 into each address.
After writing, return to

Page 1	Address 00	Data 00

(2) Mode code

Mode	Code	Mode	Code
STOP	20	EDIT S CUE	5A
FF	30	EDIT S REV	5B
REW	38	EDIT S STIL	5F
PB	60	+×1	62
CUE	64	−×1	63
REV	65	−STILL	79
STILL	70	+FRAME	76
REC	40	−FRAME	77
REC. P	41	+×2	66
SHUTTLE EDIT (+)	5A	−×2	62
SHUTTLE EDIT (−)	5B	LOADING	21
CAM STBY	41	UNLOADING	13
CAM REC	40	EJECTED	10
REC REV+	58	+SLOW	72
REC REV−	59	−SLOW	73

* 2 RECOG SW Check

With the SENSER LANC

Page	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	3D	MP-HG		ME/MP	REC PROOF	V MUTE	A MUTE	JOG	VA PB MODE

"1"=REC inhibit

"1"=ME/ 0 : MP

"1"=MPHG/ 0 : Normal

Page	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	3E	DEW			RP PB MODE	CASSETTE COMPARTMENT LOCK	MODE SW2	MODE SW1	MODE SW0

See to the following list

When locking the Cassette Compartment, "1"

- MODE SW CODE LIST

	Address 3E contents			Real port condition			Remark
Position	M SW2	M SW1	M SW0	M SW2	M SW1	M SW0	
EJECT	0	0	0	L	H	H	Cassette Compartment eject position
IA	0	0	1	H	H	H	Interval A
UNLOAD	0	1	0	L	L	H	Normal EJECT unloaded
IB	0	1	1	H	L	H	Interval B
STOP	1	0	0	H	L	L	STOP mode position
IC	1	0	1	H	H	L	Interval C
FWD	1	1	0	L	H	L	Pinch pressure welded
ID	1	1	1	L	L	L	Interval D
SHAKING HEAD POSITION	0	0	0	L	H	L	Shaking head ptsition

☆ This mode releasing is turn off the SENSER LANC.

*** 3 Switch check** (See to the previous page for reading code.)

With the SENSER LANC :

Page 1	Address E8 to ED	Data Refer to table

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Address	K IN 7	K IN 6	K IN 5	K IN 4	K IN 3	K IN 2	K IN 1	K IN 0
E 8 K OUT 0	——	REMOTE ON/OFF	AUTO SUPER IMPOSE	TITLE	——	MACRO AF	SHUTTER	AUTO LOCK
E 9 K OUT 1	——	STEREO	MEMORY	COLOR	DATA SCREEN	ONE PUSH AF	AF ON/OFF	PROGRAM AE
EA K OUT 2	——	SUB	EDIT (+)	EDIT (−)	FRAME	AWB	BACK LIGHT	——
EB K OUT 3	——	STANDBY	PAUSE	RESET	REC	FADER	——	BEEP
EC K OUT 4	——	START/ STOP	PB·	ZERO MEMORY	TIME	DATE	AGE	VTR
ED K OUT 5	——	Edit/ OFF	REW	STOP	EJECT	FF	SLOW	CAM

☆ This mode releasing is turn off the SENSER LANC.

- Check the initial set value in shipping after the service, because EE PROM is monuted to VTR in this unit.

D Page Initial set value in shipping (for this unit)

Address	Contents					Set value
0 0	Aging mode					00
0 1	Each flag area (destination/model /HEAD width1×2MUTE)					D9
0 2	VTR REC key acceptance authorization					AEP, UK : 02 E : 03
0 3						--
0 4	Switching position (low)					Adjustment value
0 5	Switching position (high)					Adjustment value
0 6	Battery A/D modification value					Adjustment value
0 7	Battery end set area					Adjustment value
1 0	SR data storage area	EDIT OFF	MP	HI8	LP	--
1 1	SR data storage area	EDIT OFF	MP	HI8	SP	--
1 2	SR data storage area	EDIT OFF	MP	NOR	LP	16
1 3	SR data storage area	EDIT OFF	MP	NOR	SP	24
1 4	SR data storage area	EDIT OFF	ME	HI8	LP	--
1 5	SR data storage area	EDIT OFF	ME	HI8	SP	--
1 6	SR data storage area	EDIT OFF	ME	NOR	LP	16
1 7	SR data storage area	EDIT OFF	ME	NOR	SP	24
1 8	Titler vertical position adjustment area JOG mode					04
1 9	Titler vertical position adjustment area NOR mode					06
1 A	Titler horizontal position adjustment area playback mode					33
1 B	Titler horizontal position adjustment area EE mode					33
1 C	When SR data storage area EDIT is ON : Hi8 mode					--
1 D	When SR data storage area EDIT is ON : Normal mode					24
1 E						--
1 F						--
2 0	First generated emergency code (low) (First emergecy)					00
2 1	First generated emergency code (high) (First emergency)					00
2 2	Mode code when emergency is generated first					00
2 3						00
2 4	Last generated emergency code (low) (Last emergency)					00
2 5	Last generated emergency code (high) (Last emergency)					00
2 6	Mode code when emergency is generated last.					00

* 4 In order to operate the motor singly

[Operation]

Write the following number with the SENSER LANC into | Page 3 | Address DD. |

Then the check of each motor is performed.

10H → Loading motor
11H → Drum motor
12H → Capstan motor

After the set of the above data, operation is performed by pressing the following keys. (When the operation is performed with RM-95, set the HOLD switch to left and release the SENSER LANC.)

FF key → Rotating in right direction
REW key → Inverting
STOP key → Stop

Note) In this mode, operation is only performed on the normally loaded condition.

Note) The motor rotating speed is the normal rotating number. (Drum 30Hz, Capstan SP mode speed, Loading normal speed).

In order to release this mode, turn off the SENSER LANC and turn off the power.

* 5 In order to read the A/D selecting value (Sensor check)

[Operation]

With the SENSER LANC:

Write | Page 3 | Address DD | Data 21 |

The following address (PAGE 3) of the A/D selecting value of each A/D port is displayed.

Address	Selecting value Contents
65	TOP sensor (light ON)
67	TOP sensor (light OFF)
64	END sensor (light ON)
66	END sensor (light OFF)
62	S-REEL FG
63	T-REEL FG
60	Thermistor (for SWP correction)
5F	DEW sensor

The voltage of A/D selecting 1 step: 4.9÷256≒19mV

* 6 In order to check the reception contents of the wireless remote control

With SENSER LANC, the received remote control code is displayed to | Page 1 | Address 1E. |

The remote control code is only displayed while the code which the LANC code is shifted to right for 1 bit is pressed, and FF is displayed when the code is released.

The received category code of the remote control is displayed to the upper 4 bit of | Page 1 | Address 1D. |

(The description of the remote control code is omitted in this chart.)

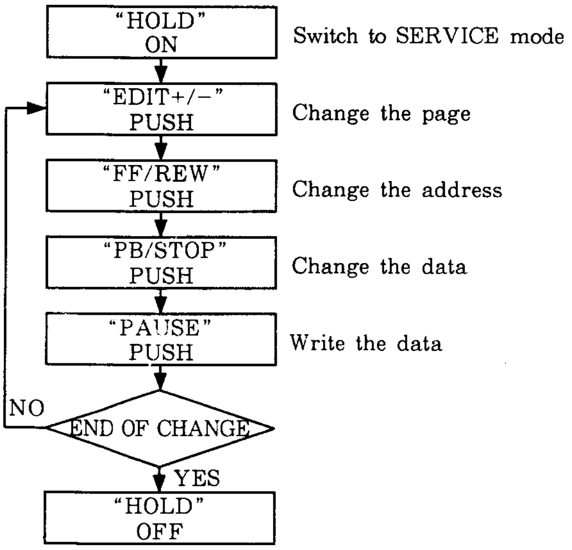
10-1-8. To Set the AEP, UK Model to REC Mode

1. Make the set CAMERA section connected.
2. Enter SERVICE mode with the adjustment remote control. (Refer to page 190 for details.)
3. Set the data at address: 00 on page: 1 to 01 ＊1.
4. Set the data at address: 02 on page: D to 03 ＊1.
5. Turn the power of the set off.
6. Turn the power of the set on.
7. Make shorting once for S510 land of VK-14 board.

After voltage measurement and adjustment, restore as follows:

1. Set the data at address: 00 on page: 1 to 01 ＊1.
2. Set the data at address: 02 on page: D to 02 ＊1.
3. Turn the power of the set off.

＊1 [To change the data]


"HOLD" ON
Switch to SERVICE mode
"EDIT+/−" PUSH
Change the page
"FF/REW" PUSH
Change the address
"PB/STOP" PUSH
Change the data
"PAUSE" PUSH
Write the data
NO
END OF CHANGE
YES
"HOLD" OFF

10-2. POWER VOLTAGE CHECK (SS-136 BOARD)

Measuring instrument	Digital voltmeter
SS 4.9V check	
Measurement point	CN506 pin ①
Specified value	$4.90 \pm 0.15V_{DC}$
AUDIO 4.9V check	
Measurement point	CN506 pin ⑦
Specified value	$4.90 \pm 0.15V_{DC}$
EVF 4.9V check	
Measurement point	CN503 pin ①
Specified value	$4.90 \pm 0.15V_{DC}$
LM 5V check	
Measurement point	CN502 pin ⑮
Specified value	$4.85 \pm 0.15V_{DC}$

[Check Method]

1) Each power voltage should satisfy the specified values at normal temperature and humidity.

10-3. SYSTEM CONTROL SYSTEM ADJUSTMENT

10-3-1. Battery Down Adjustment

Mode	CAMERA REC
Signal	Unnecessary
Measurement point	Display on the adjustment remote control
Measuring instrument	Adjustment remote control
Adjustment page	D
Adjustment address	06
Specified value	d: 7d:06 (reference value) Note: Actually, exact data of 5.5V$_{DC}$ of page D address 06 is written.

[Connection]

1) Make the set MIC board, EVF board, and CAMERA section connected.
2) Connect the adjustment remote control to the REMOTE terminal.
3) Connect the digital voltmeter so to measure the voltage of the stabilized power supply unit connected to the battery terminal.

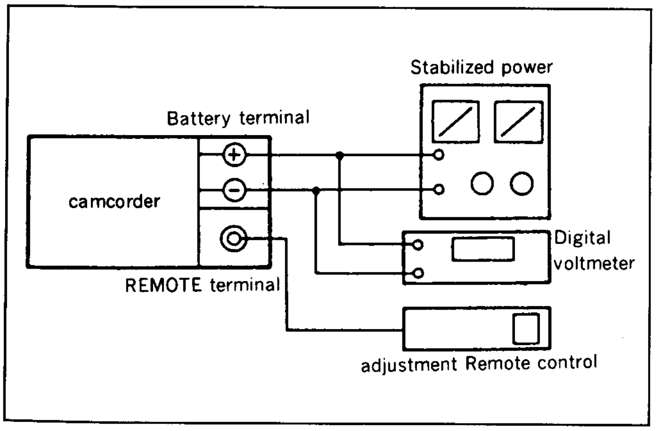
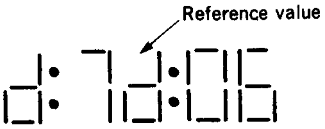


Fig. 10-3.

[Adjustment Method]

1) Turn on the POWER switch. (CAMERA mode)
2) Adjust the output of the stabilized power supply unit to be 6.3 V$_{DC}$ (battery terminal voltage).
3) Turn on the CAMERA REC mode.
4) Set the HOLD switch of the remote control for adjustment to the HOLD side.
5) Adjust the output of the stabilized power supply unit to be 5.58±0.01 V$_{DC}$. (Battery terminal voltage)
6) Press once the EDIT SEARCH (+) button of the adjustment commander select page 1, select data 01 of address 00, and release the protector.
7) Press four times the EDIT SEARCH (−)button of the remote control for adjusment. (Set the adjustment page to D.)
8) Be sure to set the adjustment address 06 with FF or REW button of the remote control for adjustment, and press the PAUSE button.



9) Turn off the POWER switch.

[Checking Method]

1) Turn on the power.
2) Adjust the output of the stabilized power supply to be 5.66±0.01V$_{DC}$.
3) Set the camera REC mode.
4) After five seconds,TALLY should flash at 0.8Hz. (Battery Pre End)
5) Adjust the output of the stabilized power supply to be 5.50±0.01V$_{DC}$.
6) Set the camera REC mode.
7) After five seconds, STOP mode should be set and TALLY should flash a 3.2Hz. (Battery END)

10-3-2. Clock Accuracy Adjustment (FU-100 Board)

Mode	E-E
Signal	Unnecessary
Measurement point	IC501 pin ㊾
Measuring instrument	Ocsilloscope Frequency counter
Adjustment element	CT501
Specified value	512.000±0.001Hz

[Adjustment Method]

1) Adjust to 512.000±0.001Hz with CT501.

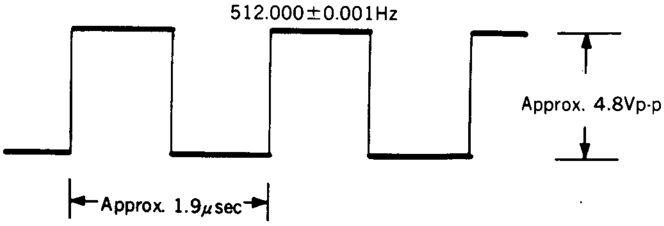


Fig. 10-4.

10-4. SERVO SYSTEM ADJUSTMENT

10-4-1. Switching Position Adjustment (SS-136 Board)

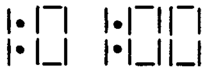
Mode	Playback
Signal	Alignment tape : Operation check (WR5-1CP)
Measurement point	CH1 : CN508 pin ④ (SWP) CH2 : CN508 pin ③ (PB RF)
Measuring instrument	Oscilloscope
Adjustment page	D
Adjustment address	05 04
Specified value	$t_1=0\pm5\mu sec$ $t_2=0\pm5\mu sec$

[Connection]

1) Make the set CAMERA section connected.
2) Connect the adjustment remote control to the REMOTE terminal.

[Adjustment Method]

1) Set the HOLD switch of the adjustment remote control to the HOLD side. (ADJUST MODE is set.)
2) Select page 1 with the remote control for adjustment and select adjustment data 01 of adjustment address 00. (Protector is released.)



3) Press four times the EDIT SEARCH (—) button of the remote control for adjustment. (Adjustment page D is set.)
4) Select the adjustment address to 05 in order to change the adjustment data, and adjust to $t_1=0\pm5\mu sec$.

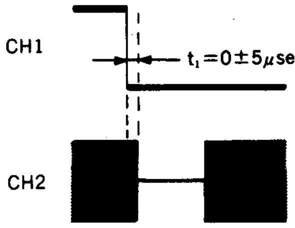


Fig. 10-5.

5) Press the PAUSE button in order to store the adjustment data.
6) Select the adjustment address 04 in order to change the adjustment data and adjust to $t_2=0\pm5\mu sec$.

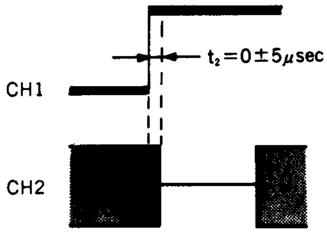


Fig. 10-6.

7) Press the PAUSE button in order to store the adjustment data.

10-4-2. Oscillation Frequency Adjustment (SS-136 Board)

Mode	REC
Signal	Unnecessary
Measurement point	Q903 collector
Measuring instrument	Oscilloscope Frequency counter
Adjustment element	RV901
Specified value	475±5kHz

[Adjustment Method]

1) Adjust to 475±5kHz with RV901.

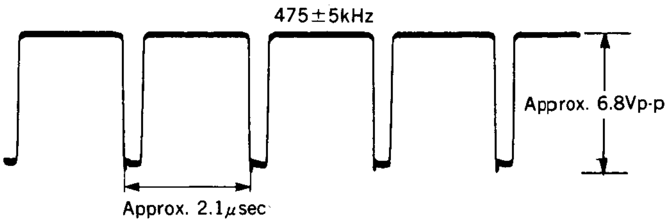


Fig. 10-7.

10-4-3. Output Voltage Adjustment (SS-136 Board)

Mode	REC
Signal	Unnecessary
Measurement point	CN507 pin ⑲
Measuring instrument	Digital voltmeter
Adjustment element	RV902
Specified value	$4.90\pm0.05V_{DC}$

[Adjustment Method]

1) Adjust to $4.90\pm0.05V_{DC}$ with RV902.

10-5. VIDEO ADJUSTMENT

The adjustment of the video system should in principle follow the adjustment procedure below. The color video input signal supplied from the pattern generator is used as the video input signal for video adjustment in the REC mode. Make sure that the SYNC signal and color burst signal are matched with the standard specified for set-up as shown in the Fig. 10-2 during adjustment.

[Adjustment Sequence]

1) Playback Frequency Characteristic Adjustment
2) X'tal Oscillator fo Check
3) REC E-E Level Adjustment
4) IR Adjustment
5) Chroma Comb Filter Adjustment
6) Emphasis Y Level Adjustment
7) Y FM Carrier Frequency Adjustment
8) Y FM Deviation Adjustment
9) REC Y FM Level Adjustment
10) Chroma Emphasis Adjustment
11) HUE Phase Deviation Adjustment
12) REC Chroma Level Adjustment
13) PB CCD Level Adjustment
14) PB Level Adjustment
15) 4FSC Frequency Adjustment
16) Controller Frequency Adjustment
17) Tracking TH Adjustment
18) Character Generator SG Frequency Adjustment
19) DDS Character Position Adjustment

10-5-1. Playback Frequency Characteristic Adjustment (SS-136 Board)

(1)

Mode	Playback
Signal	Alignment tape : Frequency characteristic adjustment (WR5-6C)
Measurement point	CH1 : CN508 pin ④ (D SWP) CH2 : CN508 pin ③ (PB RF)
Measuring instrument	Oscilloscope
Adjustment element	PB 1-CH : RP-77 board RV102 PB 2-CH : RP-77 board RV101
Specified value	3.58MHz level : 5.5MHz level=4 : 3±0.3

[Adjustment Method]

1) Adjust PB RF OUT of PB 1-CH and PB 2-CH with respective RV so as to get the specified value.

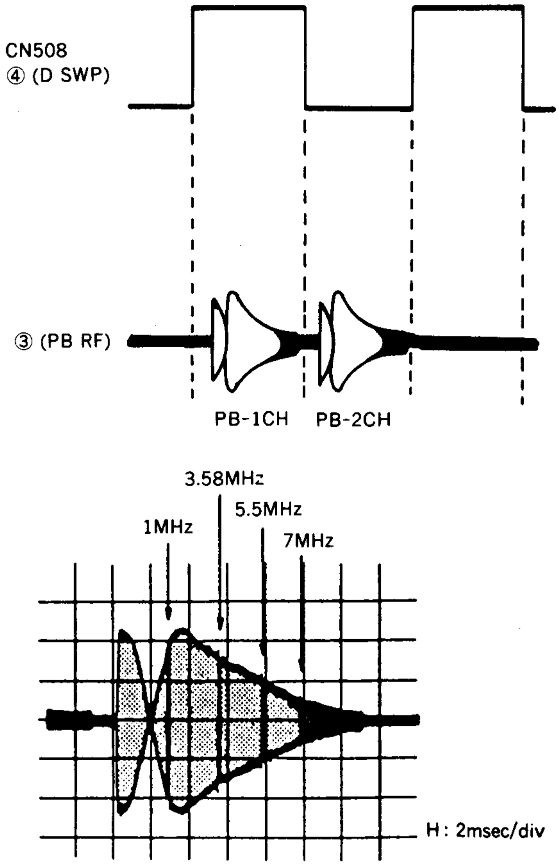


Fig. 10-8.

10-5-2. X'tal Oscillator fo Check (VA-67 Board)

Made	E-E
Signal	Color bar
Measurement point	IC203 pin ⑫
Measuring instrument	Oscilloscope Frequency counter
Specified value	4433619±70Hz

[Check Method]

1) Make sure that the oscillation frequency of IC203 pin ⑫ is 4433619±70Hz.

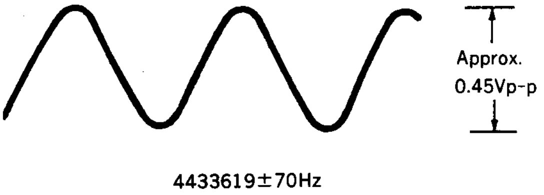

Approx.
0.45Vp-p
4433619±70Hz

Fig. 10-9.

10-5-3. REC E-E Level Adjustment (VA-67 Board)

Mode	REC or E-E
Signal	Color bar
Measurement point	J201 (VIDEO OUT terminal)
Measuring instrument	Oscilloscope
Adjustment element	RV205
Specified value	1.000±0.025Vp-p

[Adjustment Method]

1) Adjust to 1.000±0.025Vp-p with RV205.

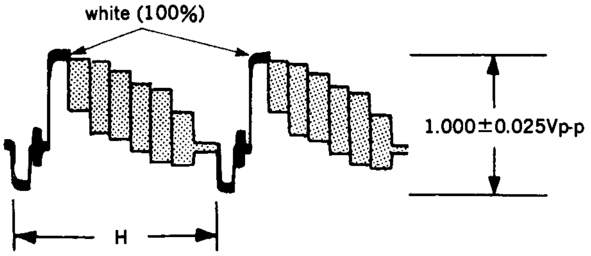

white (100%)
1.000±0.025Vp-p
H

Fig. 10-10.

10-5-4. IR Adjustment (VA-67 Board)

Mode	REC
Signal	Color bar
Measurement point	IC201 pin ⑦
Measuring instrument	Oscilloscope
Adjustment element	RV201
Specified value	Minimum red residual chroma component (50mVp-p or less)

[Connection]

1) Short TP003 and TP007.

[Adjustment Method]

1) Minimize the red residual chroma component with RV201.(50mVp-p or less)
2) After the adjustment, open TP003 and TP007.

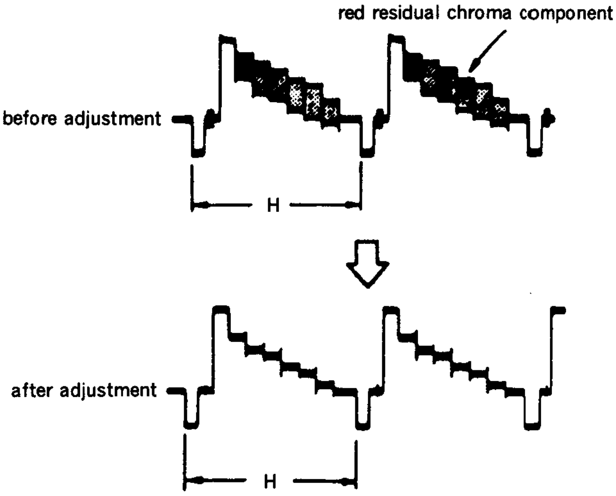

red residual chroma component
before adjustment
H
after adjustment
H

Fig. 10-11.

10-5-5. Chroma Comb Filter Adjustment (VA-67 Board)

Mode	REC
Signal	Color bar
Measurement point	IC201 pin ⑪
Measuring instrument	Oscilloscope
Adjustment element	RV204 RV211
Specified value	Minimum red residual chroma component (40mVp-p or less)

[Adjustment Method]

1) Adjust RV204 and RV211 alternately and minimize the red residual chroma component. (40mVp-p or less)

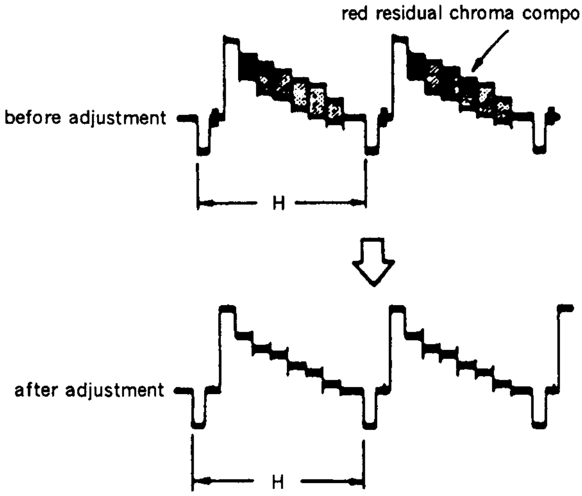


Fig. 10-12.

10-5-6. Emphasis Y Level Adjustment (VA-67 Board)

Mode	REC
Signal	Color bar
Measurement point	IC201 pin ③
Measuring instrument	Oscilloscope
Adjustment element	RV202
Specified value	500±25mVp-p

[Adjustment Method]

1) Adjust to 500±25mVp-p with RV202.

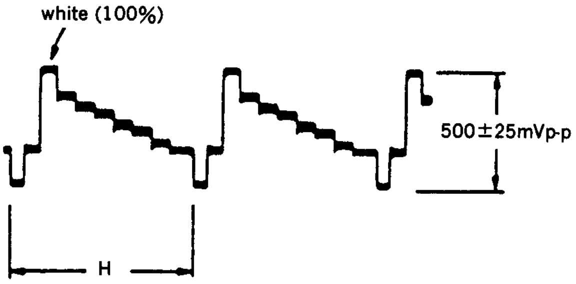


Fig. 10-13.

10-5-7. Y FM Carrier Frequency Adjustment (VA-67 Board)

Mode	REC
Signal	Non-signal
Measurement point	R158 side terminal of RV101 (REC Y)
Measuring instrument	Frequency counter
Adjustment element	RV207
Specified value	4.38±0.04MHz

[Adjustment Method]

1) Adjust to 4.38±0.04MHz with RV207.
2) Make this adjustment after completing 10-5-8. Y FM Deviation Adjustment.

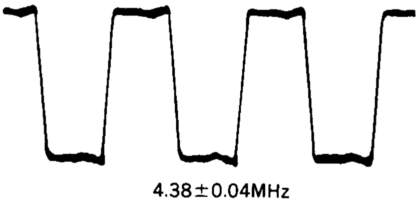


Fig. 10-14.

10-5-8. Y FM Deviation Adjustment (VA-67 Board)

Mode	REC and Playback
Signal	Color bar
Measurement point	J201 (VIDEO OUT terminal)
Measuring instrument	Oscilloscope
Adjustment element	RV206
Specified value	Playback level of 1.00±0.05Vp-p

Note 1 : 10-5-7. Y FM Carrier Frequerncy adjustment must been completed.

Note 2 : VIDEO OUT terminal (J201) must be terminated at 75Ω.

[Adjustment Method]

1) Record the color bar signal.
2) Playback the recorded signal.
3) Check the playback output level.
   Specified value : 1.00±0.05Vp-p
4) When the specified value is not, turn RV206 as follows and repeat the steps 1) through 3) above.

	RV206 Rotating Direction
When larger than specified value	Clockwise direction (↻)
When smaller than specified value	Counterclockwise direction (↺)

Table. 10-1.

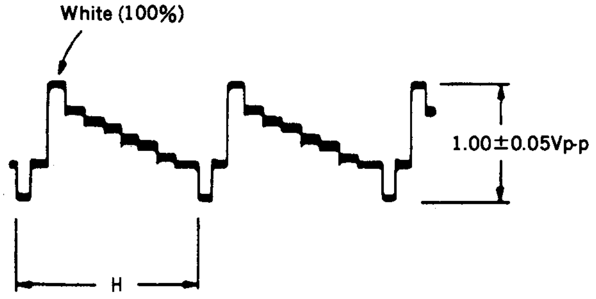


Fig. 10-15.

10-5-9. REC Y FM Level Adjustment (VA-67 Board)

Mode	REC
Signal	Non-signal
Measurement point	CN507 pin ⑤
Measuring instrument	Oscilloscope (20MHz bandwidth ON)
Adjustment element	RV101
Specified value	205±10mVp-p

[Adjustment Method]

1) Adjust to 205±10mVp-p with RV101.

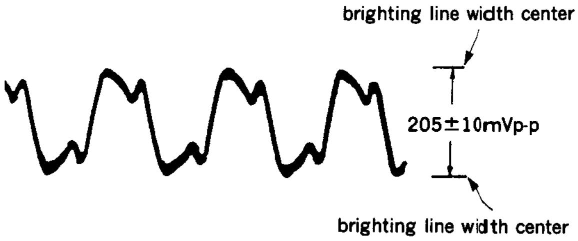


Fig. 10-16.

10-5-10. Chroma Emphasis Adjustment (VA-67 Board)

Mode	REC
Signal	Color bar
Measurement point	IC203 pin ㉔
Measuring instrument	Oscilloscope
Adjustment element	FL302
Specified value	Minimum red level

[Connection]

1) Short between IC203 pin ㉔ and GND at 3.3kΩ resistance.

[Adjustment Method]

1) Minimize the red level with FL302.
2) After the Adjustment, open between IC203 pin ㉔ and GND.

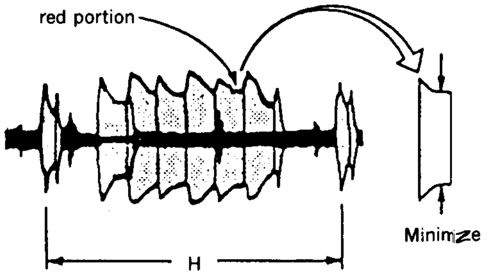


Fig. 10-17.

10-5-11. HUE Phase Deviation Adjustment (VA-67 Board) (Use a Vectorscope)

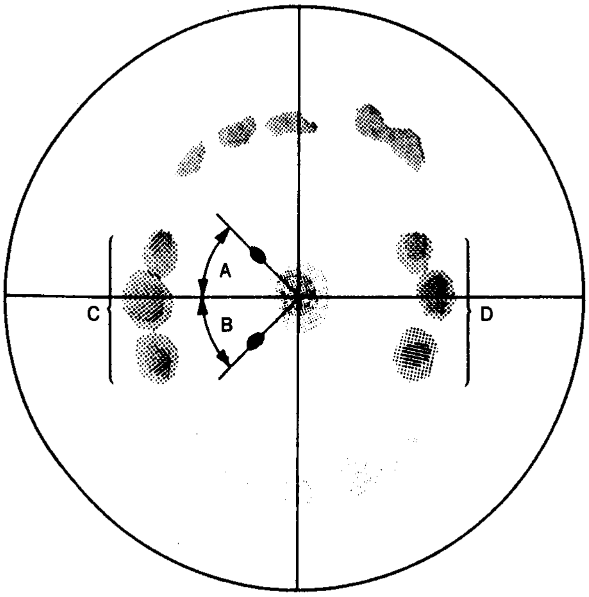
Mode	Playback+Pause
Signal	Alignment tape for operation check (WR5-5CSP), Color bar portion
Measurement point	J201 (VIDEO OUT)
Measurement equipment	Vectorscope
Adjustment element	RV353 (FSC) RV351 (APC LPF)
Specified value	See Fig. 10-18.

[Connection]

1) Input 4.43MHz signal from Pin ⑫ of IC203 to 1CH of an oscilloscope.
2) Connect 1CH output of an oscilloscope to the EXT. subcarrier reference input of a vectorscope.
3) Put on the EXT. subcarrier switch of a vectorscope.

[Adjustment Method]

1) Adjust with RV353 so as to equalize A and B as shown in Fig. 10-18.
2) Adjust with RV351 so as to minimize the shaking of each three brighting point of C and D.



RV353: A=B

RV351: make C and D a contrast

Fig. 10-18.

10-5-12. REC Chroma Level Adjustment (VA-67 Board)

Mode	REC
Signal	Color bar
Measurement point	CN507 pin ①
Measuring instrument	Oscilloscope
Adjustment element	RV301
Specified value	Red portion level=95±10mVp-p

[Adjustment Method]

1) Adjust the red portion to 95±10mVp-p with RV301.

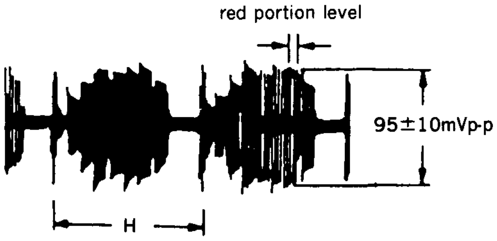


Fig. 10-19.

10-5-13. PB CCD Input Level Adjustment (VA-67 Board)

Mode	Playback
Signal	Alignment tape : Operation check (WR5-5CSP) color bar portion
Measurement point	IC201 pin ㉑
Measuring instrument	Oscilloscope
Adjustment element	RV210
Specified value	500±25mVp-p

[Adjustment Method]

1) Adjust to 500±25mVp-p with RV210.

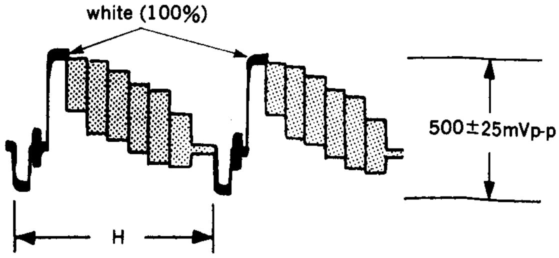


Fig. 10-20.

10-5-14. PB Level Adjustment (VA-67 Board)

Mode	Playback
Signal	Alignment tape : Operation check (WR5-5CSP) color bar portion
Measurement point	J201 (VIDEO OUT terminal)
Measuring instrument	Oscilloscope
Adjustment element	RV203
Specified value	1.00±0.05Vp-p

[Adjustment Method]

1) Adjust to 1.00±0.05Vp-p with RV203.

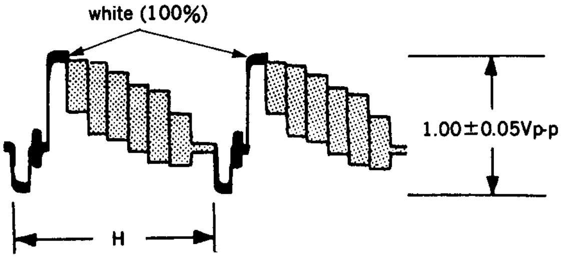


Fig. 10-21.

10-5-15. 4FSC Frequency Adjustment (CT-38 Board)

Mode	E-E
Signal	Non-signal
Measurement point	Q707 Emitter
Measuring instrument	Oscilloscope Frequency counter
Adjustment element	CT702
Specified value	4433619±50Hz
Adjustment procedure	IC704 pin ⑲ : $5V_{DC}$ IC704 pin ㉝ : $3.5V_{DC}$

[Adjustment Method]

1) Adjust to 4433619±50Hz with CT702.

10-5-16. Controller Frequency Adjustment (CT-38 Board)

Mode	CAM E-E (All title white display)
Signal	Not required
Measurement point	VA-67 board J201 (VIDEO OUT)
Measuring instrument	Oscilloscope
Adjustment element	CT701
Specified value	2.0±0.3μ sec

Note : Perform the adjustment with the camera installed.

[Adjustment Method]

1) Display the all title (white) by fetching with the camera E-E.
2) Measure the VIDEO OUT terminal with the oscilloscope, adjust so that the width between the right end of the title and the H-SYNC is 2.0±0.3μ sec.

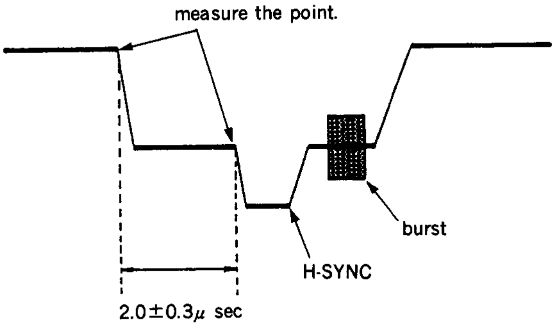


Fig. 10-22.

10-5-17. Tracking TH Adjustment (CT-38 Board)

Mode	E-E
Signal	Staircase (8 stairs)
Measurement point	CH 1 : W704 pin ⑦ (Staircase input) CH 2 : IC703 pin ① (A/D select output)
Measuring instrument	Oscilloscope
Adjustment element	RV703
Specified value	Staircases to the second stair should be fetched and the third one should not be fetched.

[Adjustment Method]

1) Adjust to satisfy the specified value with RV703. (Refer to Fig. 10-23.

Note : In the case that ten staircases are used. the third stair should be fetched and the fourth one should not be fetched.

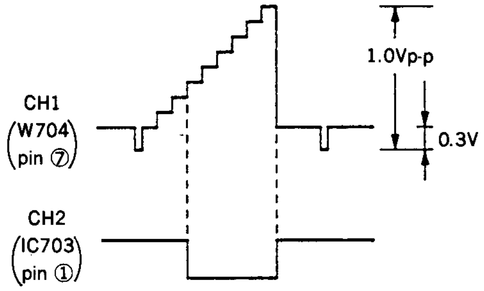


Fig. 10-23.

10-5-18. Character Generator SG Frequency Adjustment (CT-38 Board)

Mode	E-E
Signal	Non-signal
Measurement point	IC902 pin ⑲
Measuring instrument	Oscilloscope Frequency counter
Adjustment element	CT902
Specified value	15625±100Hz

[Adjustment Method]

1) Adjust to 15625±100Hz with CT902.

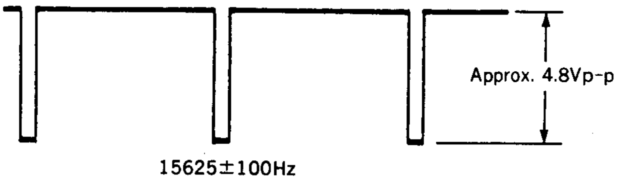


Fig. 10-24.

10-5-19. DDS Character Position Adjustment (CT-38 Board)

Mode	E-E
Signal	Color bar
Measurement point	EVF
Measuring instrument	EVF
Adjustmen element	CT901
Specified value	Refer to Fig. 10-25.

[Adjustment Method]

1) Turn on the DATA SCREEN switch (VK-14 board S508). (Check that it is displayed on the EVF.)
2) Adjust the last inner line to the dividing line between blue and black with CT901. (Refer to Fig. 10-25)
3) Turn off the DATA SCREEN switch (VK-14 board S508). (Check that it went out on the EVF.)

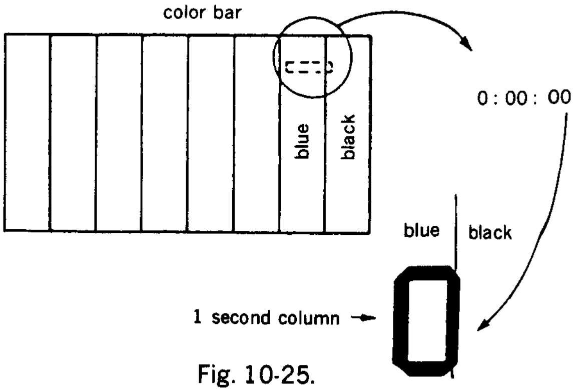


Fig. 10-25.

10-6. AUDIO SYSTEM ADJUSTMENT

- Perform adjustment with the color bar signal used as the video input signal.

[Connection of audio measuring instrument]

In addition to the video system measuring instruments, connect the audio system measuring instruments as shown in the figure below, and set the power switch to the video position for adjustment.

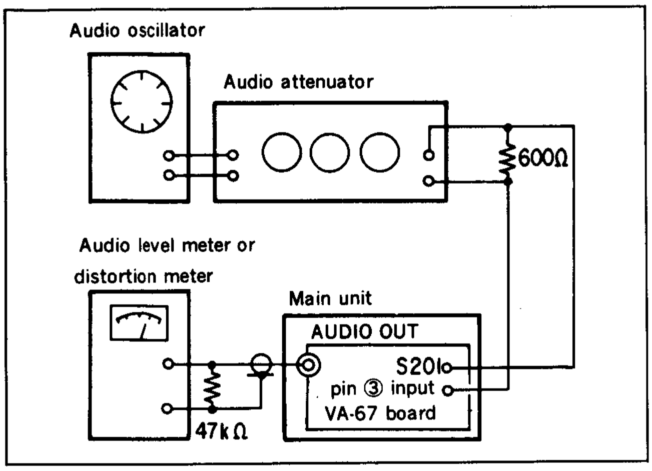

Audio oscillator
Audio attenuator
600Ω
Audio level meter or distortion meter
Main unit
AUDIO OUT
S201
pin ③ input
VA-67 board
47kΩ

Fig. 10-26.

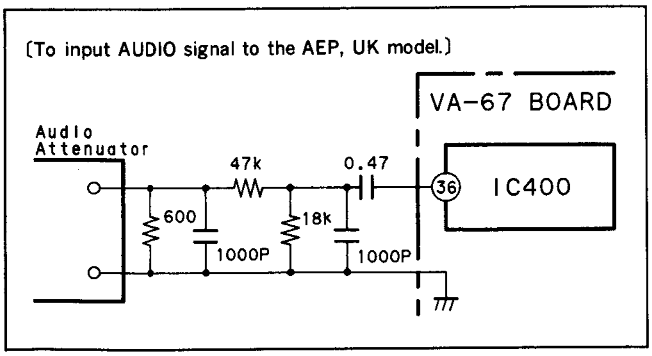

[To input AUDIO signal to the AEP, UK model.]
VA-67 BOARD
Audio Attenuator
47k
0.47
36
IC400
600
18k
1000P
1000P

Fig. 10-27.

10-6-1. AFM Carrier Frequency Check (VA-67 Board)

Mode	REC
Signal	Non-signal
Measurement point	IC400 pin ⑧
Measuring instrument	Frequency counter
Specified value	1.500±0.002MHz

Note : Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

[Checking Method]

1) Turn OFF the audio oscillator output.
2) Confirm that the AFM carrier frequency is 1.500 ±0.002MHz.

10-6-2. REC AFM Carrier Level Check (VA-67 Board)

Mode	REC
Signal	Non-signal
Measurement point	CN507 pin ②
Measuring instrument	Oscilloscope
Specified value	700±5mVp-p

[Checking Method]

1) Confirm that the level is 700±5mVp-p.

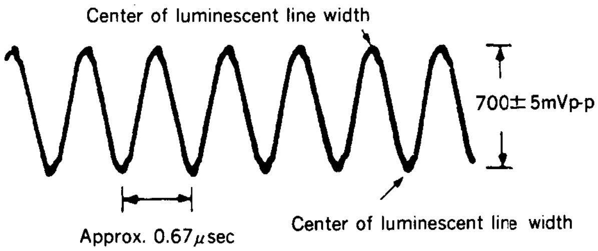

Center of luminescent line width
700±5mVp-p
Approx. 0.67μsec
Center of luminescent line width

Fig. 10-28.

10-6-3. IR Adjustment (VA-67 Board)

Mode	Playback
Signal	Alignment tape : Operation checking (WR5-5CSP)
Measurement point	IC400 pin ④
Measuring instrument	Oscilloscope
Adjustment element	RV400
Specified value	Refer to Fig. 10-29.

[Preparation]

1) Short between IC400 pin ④ and GND at 4.7kΩ resistance.

[Adjustment Method]

1) As shown in Fig. 10-29, adjust RV400.
2) After the adjustment, open between IC400 pin ④ and GND.

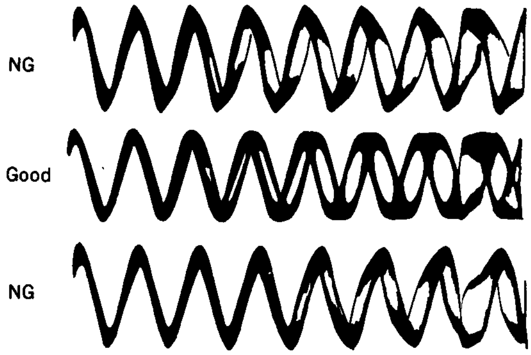


Fig. 10-29.

10-6-4. Deviation Adjustment

Mode	Playback
Signal	Alignment tape: Operation checking (WR5-5CSP)
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Adjustment element	RV401
Specified value	−7.5±1.0dBs

[Adjustment Method]

1) Adjust to −7.5±1.0dBs with RV401.

10-6-5. E-E Output Level Check

Mode	E-E
Signal	400Hz, −7.5dBs
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	−7.5±2dBs

[Checking Method]

1) Make sure that the audio output level is −7.5±2dBs.

10-6-6. Overall Level Check

Mode	Self-recording and playback
Signal	400Hz, −7.5dBs.
Measuremrnt point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	−7.5±2dBs.

[Checking Method]

1) Record the signal.
2) Playback the recorded section
3) Make sure that the audio output level is −7.5±2dBs.

10-6-7. Overall Frequency Characteristics Check

Mode	Self-recording and playback
Signal	Ⓐ 400Hz, −17.5dBs Ⓑ 30Hz, −17.5dBs Ⓒ 10Hz, −17.5dBs
Measurement point	Audio output termial
Measuring instrument	Audio level meter
Specified value	With the 400Hz playback output level as 0dB, the playback output level of 30Hz and 10kHz is 0±3dB

[Checking Method]

1) Record signal Ⓐ through Ⓒ in order.
2) Playback the recorded sections.
3) With the 400Hz playback output level as 0dB, confirm that the playback output level of 30Hz and 10kHz is 0±3dB.

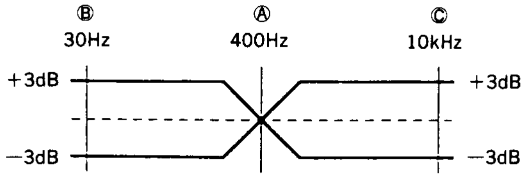


Fig. 10-30.

10-6-8. Overall Distortion Check

Mode	Self recording and playback
Signal	400Hz, −7.5dBs
Measurement point	Audio output terminal
Measuring instrument	Distorsion meter
Specified value	Less than 0.8%*1

[Checking Method]

1) Record the signal.
2) Playback the recorded section.
3) Confirm that the distortion is less than 0.8%.*1

* 1 Value when 200Hz to 3kHz BPF is used.

10-6-9. Overall Noise Level Check

Mode	Self-recording and playback
Signal	No signal (Short between input point and GND with a jumper wire.)
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	Less than −62.0dBs[*2]

[Checking Method]

1) Record the signal
2) Playback the recorded section
3) Make sure that the noise level is less than −62.0dBs.[*2]

   ＊ 2 Value when IHF-A hearing correction filter is used.

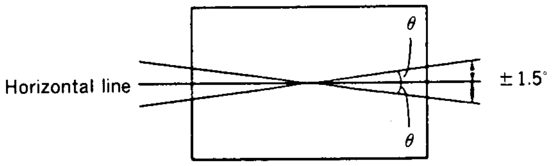
10-7. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (A TYPE) (VF-27 BOARD)

10-7-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified value	See Fig. 10-31

[Adjustment Method]

1) By turning RV904 (BRIGHT), adjust for a luminance level which provides appropriate visibility of the CRT screen.
2) Loosen the DY (deflection yoke) tightening nut.
3) Make the image horizontal by rotating DY.
4) Retighten the DY tightening nut. (Do not tighten excessively.)


θ
Horizontal line
±1.5°
θ

Specified value: Image orientation within ±1.5° of horizontal line.

Fig. 10-31.

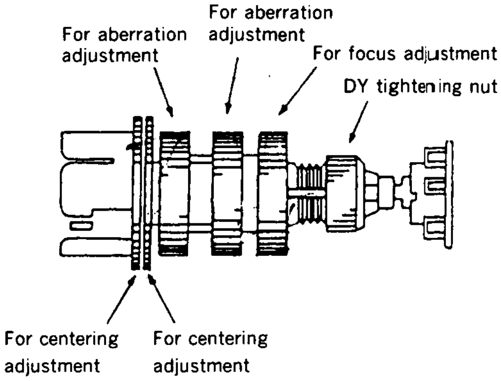

For aberration adjustment
For aberration adjustment
For focus adjustment
DY tightening nut
For centering adjustment
For centering adjustment

Fig. 10-32.

10-7-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified value	See Fig. 10-33.

[Adjustment Method]

1) Turn the centering adjustment rings to provide an image with even night, left, upper and lower margins. (See Fig. 10-32.)

Note : Since the centering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

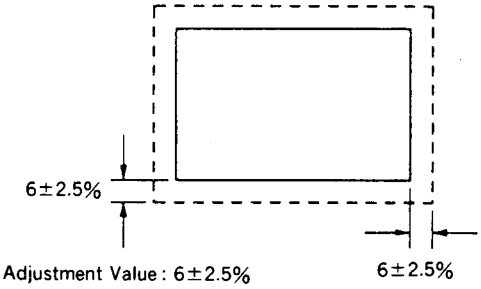


Fig. 10-33.

10-7-3. Focus Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion

[Adjustment Method]

1) Adjust for optimum focus using the focus ring. (See Fig. 10-32.)

10-7-4. Aberration Adjustment

Mode	E-E
Signal	Dot pattern
Specified value	See Fig. 10-34.

[Adjustment Method]

1) Use the aberration adjustment rings to adjust any trailing dots to within 2 times the dot diameter and any fan shaped aberrations to within the dot diameter.
2) If off center, repeat the Centering Adjustment.

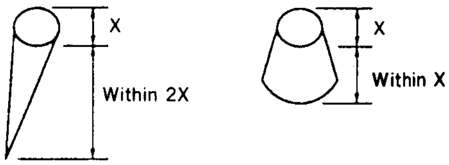


Fig. 10-34.

10-7-5. Horizontal Oscillation Frequency Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP)
Measurement point	CN904 pin ⑤
Measuring instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment element	RV901
Specified value	$2.60\pm0.05V_{DC}$

[Adjustment Method]

1) Adjust to $2.60\pm0.05V_{DC}$ using RV901.

10-7-6. Horizontal Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for cheking operation (WR5-5CSP) Monoscope portion
Adjustment element	C911
Specified value	6.0±3.0%

[Adjustment Method]

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by rotating RV902.
2) Rotate RV904 to set the brightness to the normal level.
3) Short or open the pattern (A) of the H size adjustment capacitor (C911) to provide horizontal overscans of 6.0±3.0% (total of left and right). (See Fig. 10-36.)

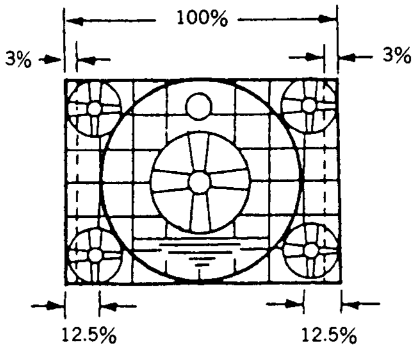
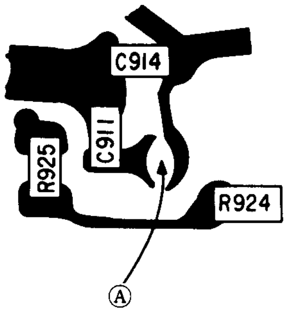


Fig. 10-35.



VF-27 Board
(conductor side)

A section	H size
Open	Large
Short	Small

Fig. 10-36.

10-7-7. Vertical Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	RV902
Specified value	6.0±3.0%

[Adjustment Method]

1) By turning RV902, adjust vertical overscan to 6.0±3.0% (upper and lower total).

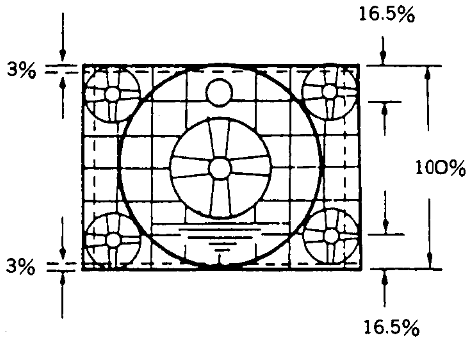


Fig. 10-37.

10-7-8. Brightness, Contrast Adjustments

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	Brightness : RV904 Contrast : RV903

[Adjustment Method]

1) Perform brightness and contrast adjustments alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

10-7-9. Horizontal Amplitude, Vertical Amplitude and Focus Checks

Values should conform to specifications given in 10-7-6. Horizontal Amplitude Adjustment and 10-7-7. Vertical Amplitude Adjustment. If not. readjust accordingly, and repeat 10-7-8. Brightness, Contrast Adjustments. In this case, focus needs to be checked. If the image is not clear, perform 10-7-3. Focus Adjustment and 10-7-4. Aberration Adjustment.

10-8. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (B TYPE) (VF-26 BOARD)

10-8-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified value	See Fig. 10-39.

[Adjustment Method]

1) Adjust the volume array Ⓓ (BRIGHT) for appropriate brightness on CRT screen. (See Fig. 10-40.)
2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 10-38.)
3) Make a picture horizontal by turning the DY.
4) Retighten the nut. (Do not tighten excessively.)

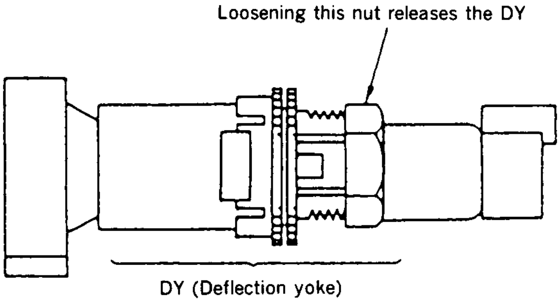
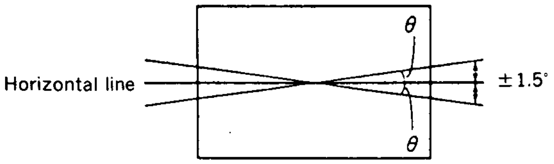

Loosening this nut releases the DY
DY (Deflection yoke)

Fig. 10-38.


θ
Horizontal line
±1.5°
θ

Specified value: Image orientation within±1.5° of horizontal line.

Fig. 10-39.

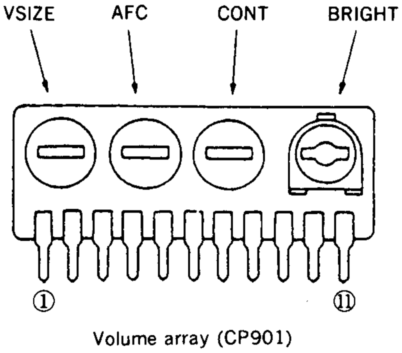

Ⓐ VSIZE
Ⓑ AFC
Ⓒ CONT
Ⓓ BRIGHT
①
⑪
Volume array (CP901)

Fig. 10-40.

10-8-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified value	See Fig. 10-42.

[Adjustment Method]

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 10-41.)

Note : Since the cenering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

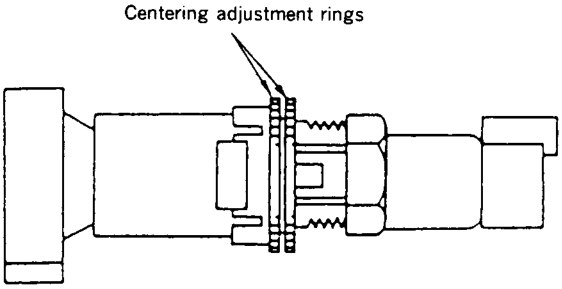

Centering adjustment rings

Fig. 10-41.

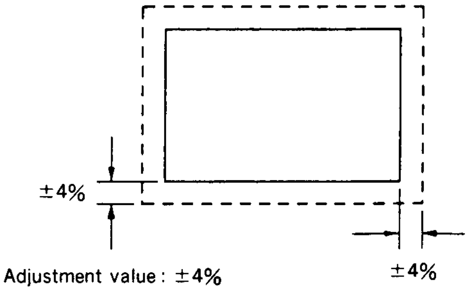

±4%
Adjustment value : ±4%
±4%

Fig. 10-42.

10-8-3. AFC Adjustment

Mode	E-E or Camera standby
Signal	Color bar
Measurement Point	C915 ⊕ side
Measuring instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment element	Volume array Ⓑ (AFC)
Specified value	$2.6\pm0.1V_{DC}$

[Adjustment Method]

1) Adjust volume array Ⓑ (AFC) for $2.6\pm0.1V_{DC}$. (See Fig. 10-40.)

10-8-4. Horizontal Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	C905
Specified value	6.0±3.0%

[Adjustment Method]

1) Line up the upper and lower section of monoscope image with the upper and lower edges of the screen by rotating volume array Ⓐ (V SIZE). (See Fig. 10-40.)
2) Rotate volume array Ⓓ (BRIGHT) to set the brightness to the normal level.
3) Short or open the pattern A of the H size adjustment capacitor (C905) to provide horizontal overscans of 6.0± 3.0% (total of left and right). (See Fig. 10-44.)

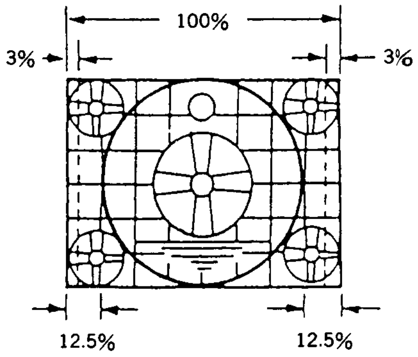
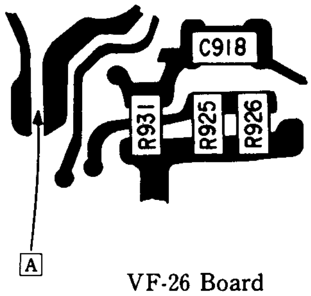


Fig. 10-43.



VF-26 Board
(conductor side)

A section	H size
Open	Large
Short	Small

Fig. 10-44.

10-8-5. Vertical Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	Volume array Ⓐ (V SIZE)
Specified value	6.0±3.0%

[Adjustment Method]

1) By turning volume array Ⓐ (V SIZE), adjust vertical overscan to 6.0±3.0% (upper and lower total). (See Fig. 10-45.)

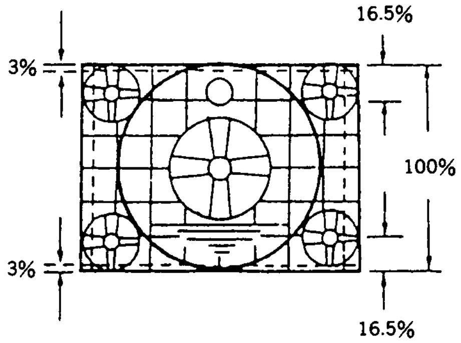


Fig. 10-45.

10-8-6. Focus Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	RV901

[Adjustment Method]

1) Adjust to the best focus point with RV901.

10-8-7. Brightness, Contrast Adjustments

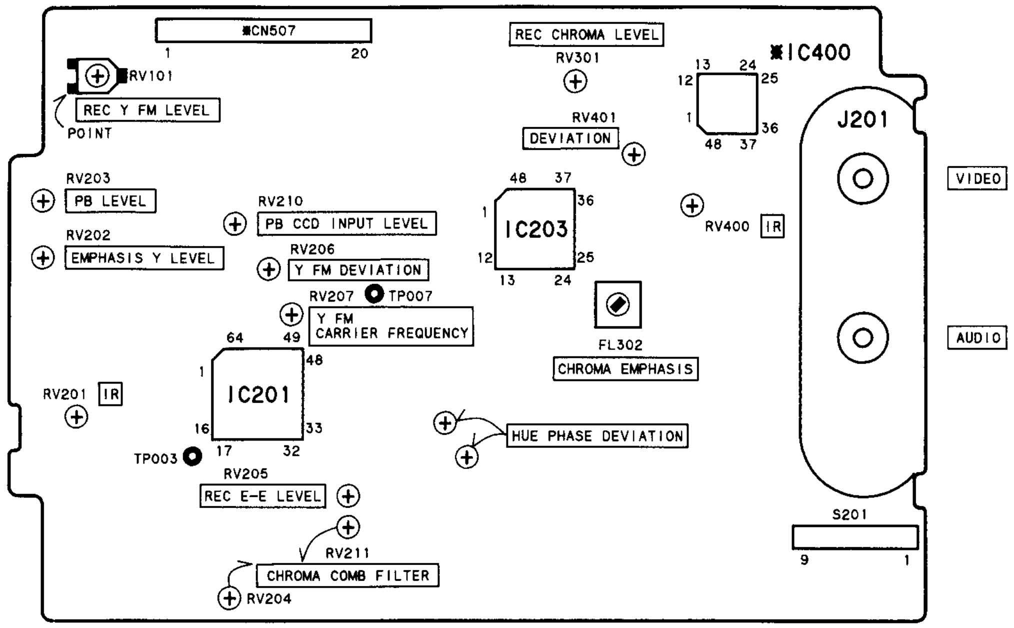
Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	Brightness: Volume array Ⓓ (BRIGHT) Contrast: Volume array Ⓒ (CONT)

[Adjustment Method]

1) Adjust volume array Ⓓ (BRIGHT) and Ⓒ (CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest areas is possible.) (See Fig. 10-40.)

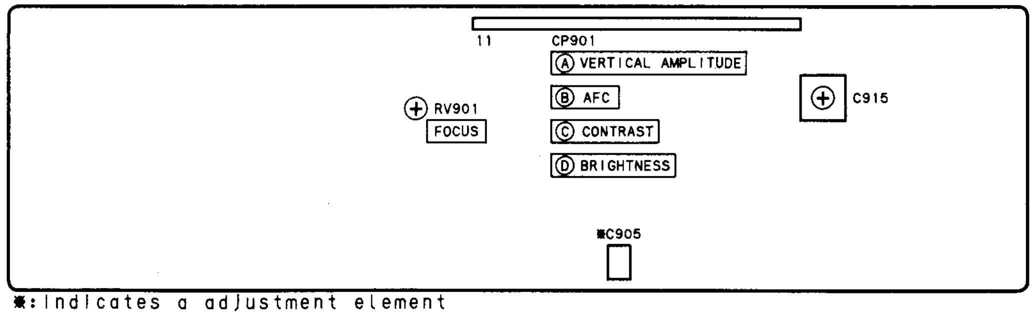
10-9. ADJUSTING PART LOCATION DIAGRAM

VA-67 BOARD (COMPONENT SIDE)


*CN507
1
20
RV101
REC Y FM LEVEL
POINT
RV203
PB LEVEL
RV202
EMPHASIS Y LEVEL
RV210
PB CCD INPUT LEVEL
RV206
Y FM DEVIATION
RV207
TP007
Y FM CARRIER FREQUENCY
REC CHROMA LEVEL
RV301
RV401
DEVIATION
IC203
*IC400
RV400
IR
J201
VIDEO
AUDIO
FL302
CHROMA EMPHASIS
IC201
RV201
IR
TP003
RV205
REC E-E LEVEL
HUE PHASE DEVIATION
RV211
CHROMA COMB FILTER
RV204
S201

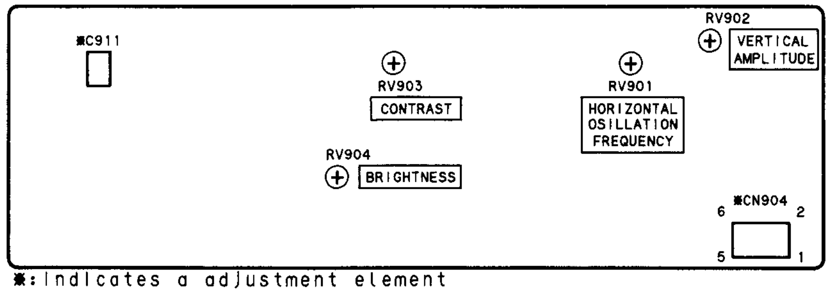
*: Indicates a adjustment element mounted on the conductor side.

VF-26 BOARD (COMPONENT SIDE)


CP901
Ⓐ VERTICAL AMPLITUDE
Ⓑ AFC
Ⓒ CONTRAST
Ⓓ BRIGHTNESS
RV901
FOCUS
C915
*C905

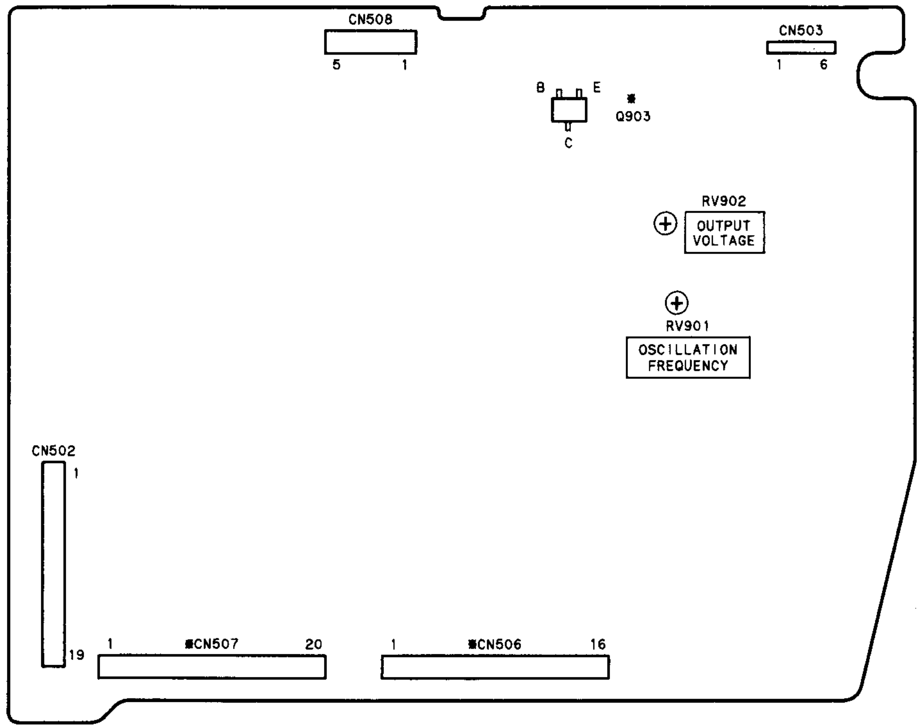
*: Indicates a adjustment element mounted on the conductor side.

VF-27 BOARD (COMPONENT SIDE)


*C911
RV903
CONTRAST
RV904
BRIGHTNESS
RV901
HORIZONTAL OSILLATION FREQUENCY
RV902
VERTICAL AMPLITUDE
*CN904

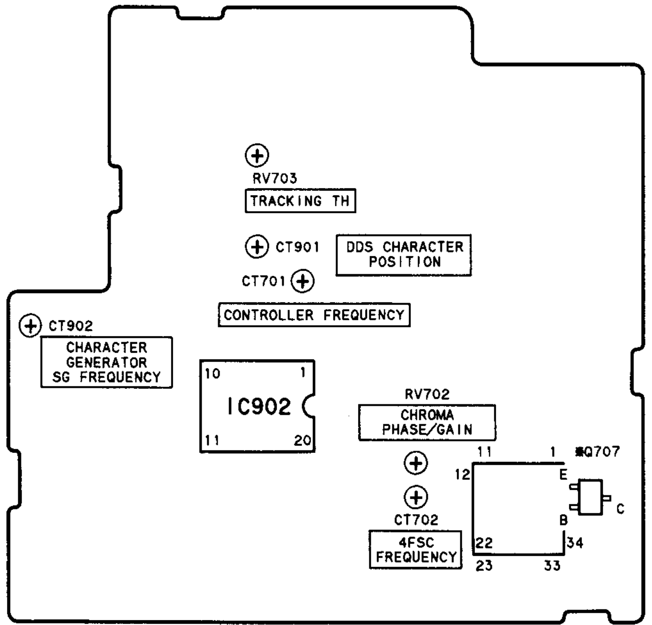
*: Indicates a adjustment element mounted on the conductor side.

SS-136 BOARD (COMPONENT SIDE)


CN508
CN503
*Q903
RV902
OUTPUT VOLTAGE
RV901
OSCILLATION FREQUENCY
CN502
*CN507
*CN506

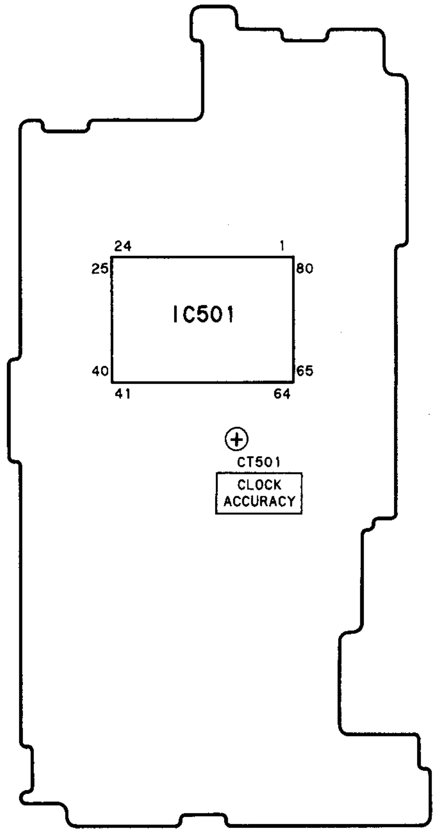
*: Indicates a adjustment element mounted on the conductor side.

CT-38 BOARD (COMPONENT SIDE)


RV703
TRACKING TH
CT901
DDS CHARACTER POSITION
CT701
CONTROLLER FREQUENCY
CT902
CHARACTER GENERATOR SG FREQUENCY
IC902
RV702
CHROMA PHASE/GAIN
CT702
4FSC FREQUENCY
*Q707

*: Indicates a adjustment element mounted on the conductor side.

FU-100 BOARD (COMPONENT SIDE)

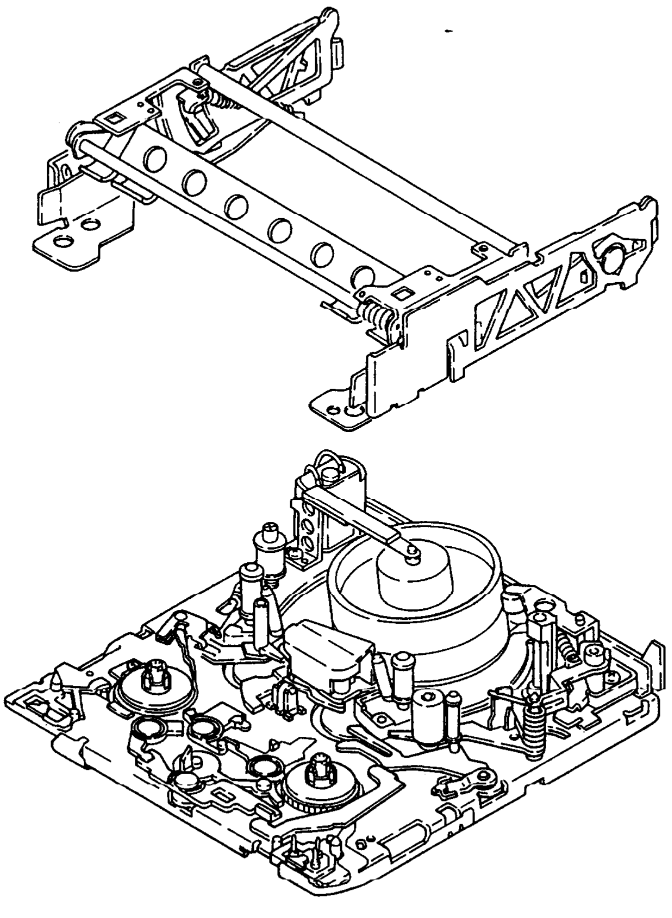

IC501
CT501
CLOCK ACCURACY

mm Video MECHANICAL ADJUSTMENT MANUAL III

U MECHANISM

Video 8

Please use in conjunction with the SERVICE MANUAL.



8 MECHANISM DECK

SONY®

TABLE OF CONTENTS

Section Title Page

1. PREPARATIONS FOR MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

1-1. Operation without Cassette Compartment Assembly and Tape 3
1-1-1. How to Trigger the Loading Operation 3
1-1-2. Setting the Playback Mode 3
1-1-3. Eject Operation 3
1-2. The Mode Selector 4
1-2-1. Name of Each Part (external) 4
1-2-2. Connections 4
1-2-3. Handling 4

2. PERIODICAL CHECK AND MAINTENANCE

2-1. Rotary Drum Assembly Cleaning 5
2-2. Tape Path Cleaning 5
2-3. Drive System Cleaning 5
2-4. Periodical Check Items 6
2-5. Servicing Tools 7

3. MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

3-1. HC Roller Assembly 8
3-2. Guide Guard Assembly 8
3-3. DC Motor (Capstan Motor) Assembly 9
3-4. S Brake, T Brake 10
3-5. LB Brake, Axle Holding Pins 11
3-6. LB Release Arm 12
3-7. RK Stopper, RK Stopper Arms 12
3-8. Pinch Arm Assembly, TG-7 Assembly 13
3-9. TG-2 Assembly 14
3-10. S Reel Table Assembly, T Reel Table Assembly 15
3-11. Tension Regulator Band Assembly, Tension Regulator Arm Assembly 16
3-12. Tension Regulator FWD Position Preset 17
3-13. Drum Assembly, Dew Sensor 18
3-14. Eject Lever, Switch Lever Assembly, Pinch Roller Sub Arm Assembly 19
3-15. Timing Belt (L), RC Gear Assembly, Loading Lever Assembly, Timing Belt (S), Connecting Gear Assembly 20
3-16. Idler Pulley, TS Brake Assembly, LB Gear Assembly, RK Gear Assembly 21
3-17. UL Gear, UL Brake, UL Arm, LB Plate Spring 22
3-18. Coaster (Right) Assembly, Drive Gear (Right) Assembly 23
3-19. Coaster (Left) Assembly, Drive Gear (Left) Assembly 24
3-20. Loading Motor, Brake Release Arm, Wheel Gear, Worm Assembly 25
3-21. Rotary Upper Drum Replacement 26
3-22. FWD Back Tension 27
3-23. Reel Torque Check 27

Section Title Page

4. TAPE PATH ADJUSTMENT

4-1. Track Shift Mode Setting 28
4-2. Preparations for Adjustment 29
4-3. Tracking Adjustment 30
4-4. Tracking Fine Adjustment 30
4-5. No.2 Guide (TG-2) Adjustment 30
4-5-1. No.2 Guide (TG-2) Height Presetting 30
4-5-2. No.2 Guide (TG-2) Adjustment 31
4-6. No.7 Guide (TG-7) Adjustment 31
4-7. Cue and REV Waveform Check 31
4-8. Check After Adjustment 32
4-8-1. Tracking Check 32
4-8-2. Rising Check 32
4-8-3. Tape Path Check 32

1. PREPARATIONS FOR MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

Note: For removal of the cabinet, the boards, the cassette compartment, etc., refer to the service guides.

1-1. OPERATION WITHOUT CASSETTE COMPARTMENT ASSEMBLY AND TAPE

Note: The unit will not work if exposed to a strong light.

1-1-1. How to Trigger the Loading Operation (See Fig. 1-1.)

1) Supply power to the unit after removing the cabinet, the camera block, the cassette compartment assembly, etc., as indicated in the service guides. (This will enable operation of the mechanical deck.)
2) Cover the LED assembly with an opaque cap, etc. ❶.
3) Attach a piece of tape to the RECOG switch ❷ so that the pin is held down.
4) Push the EJECT lever ❸ in the direction of the arrow Ⓐ.

1-1-2. Setting the Playback Mode (See Fig. 1-1.)

1) Follow the procedures in section 1-1-1. above.
2) Put the rubber band ❹ around the S and T reels.
3) Press the PLAY switch of unit, then push the tension regulator arm assembly ❺ in the direction of the arrow Ⓑ when the T reel starts to rotate (the tension regulator band will be released, and the S reel will start rotating).
4) To stop operation, press the STOP switch.

1-1-3. Eject Operation (See Fig. 1-1.)

1) To eject, turn the EJECT switch on.

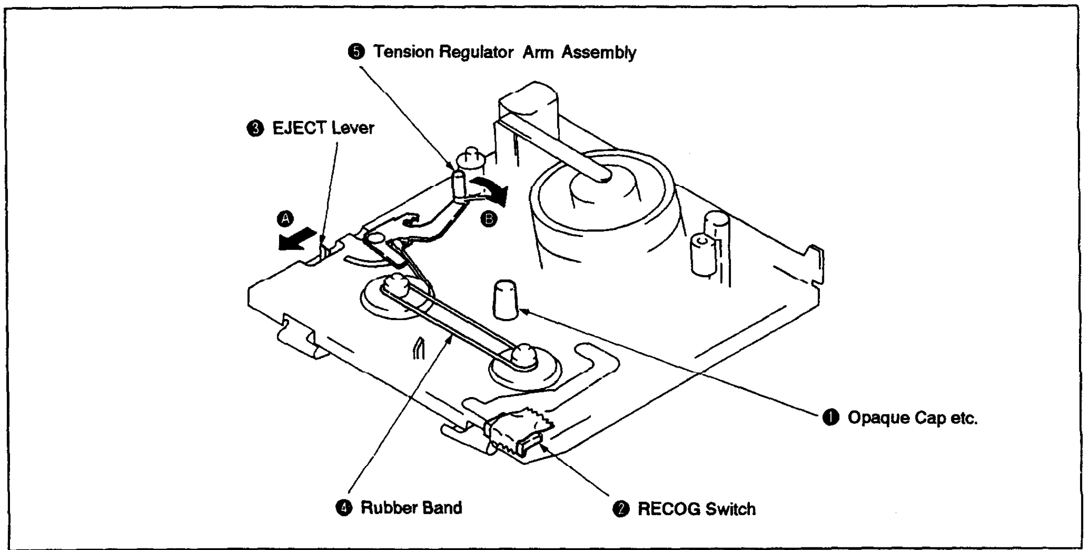


Fig. 1-1.

1-2. THE MODE SELECTOR

1-2-1. Name of Each Part (external) (See Fig. 1-2.)

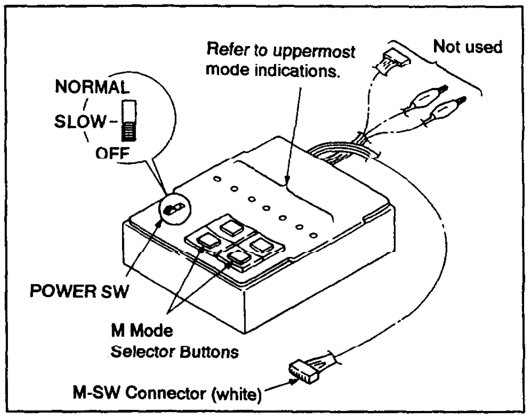

Refer to uppermost mode indications.
Not used
NORMAL
SLOW
OFF
POWER SW
M Mode Selector Buttons
M-SW Connector (white)

Fig. 1-2.

1-2-2. Connections (See Fig. 1-3.)

1) Mount the MODE SELECTOR III panel (Ref. No. J-9) ❶ onto the mode selector.
2) Attach the conversion connector (Ref. No. J-8) ❸ of MODE SELECTOR III to the 6-pin connector (white) ❷ of the mode selector M-SW.
3) Remove the FP-89 flexible board ❺ from the flexible connector ❹.
4) Attach the FP-89 flexible board ❺ to the flexible connector ❻ of the MODE SELECTOR III conversion connector ❸, then attach the 2-pin connector (white) ❽ of the loading motor to the 2-pin connector (white) ❼.

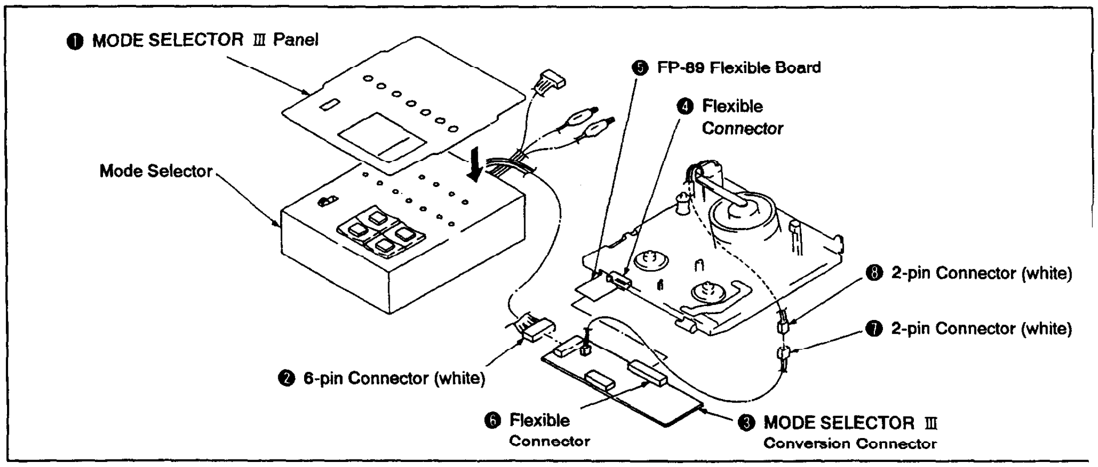

❶ MODE SELECTOR Ⅲ Panel
Mode Selector
❺ FP-89 Flexible Board
❹ Flexible Connector
❽ 2-pin Connector (white)
❼ 2-pin Connector (white)
❷ 6-pin Connector (white)
❻ Flexible Connector
❸ MODE SELECTOR Ⅲ Conversion Connector

Fig. 1-3.

1-2-3. Handling (See Figs. 1-2. and 1-4.)

- Use only the M mode selector buttons.
- Refer to mode indications on the uppermost part of the MODE SELECTOR III panel.
- If the right M mode selector button is kept pressed, the lit indication will change in the order of EJECT → (IA) → ULD → (IB) → STOP → (IC) → FWD.
- To change modes in the reverse direction (from FWD to EJECT), press the left selector button.

Note: For this U mechanism, the uppermost indicators on the MODE SELECTOR III panel are used. The IA, IB and IC indications light up during mode changes.

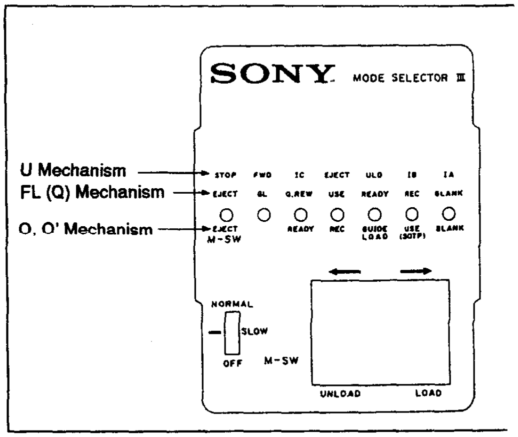

SONY
MODE SELECTOR Ⅲ
U Mechanism
FL (Q) Mechanism
O, O' Mechanism
STOP
FWD
IC
EJECT
ULD
IB
IA
EJECT
QL
Q.REW
USE
READY
REC
BLANK
EJECT
M-SW
READY
REC
GUIDE LOAD
USE (SOTP)
BLANK
NORMAL
SLOW
OFF
M-SW
UNLOAD
LOAD

Fig. 1-4.

2. PERIODICAL CHECK AND MAINTENANCE (See Fig. 2-1.)

The following periodical check and maintenance procedures are necessary to ensure proper operation and to protect the tapes as well as the unit, and the following maintenance procedures must be always carried out after repairing regardless of how long the unit has been used.

2-1. ROTARY DRUM ASSEMBLY CLEANING

1) While pressing a piece of chamois leather (Ref. No. J-2) moistened in cleaning fluid (Ref. No. J-1) lightly against the rotary drum, turn the rotary upper drum slowly counterclockwise with your fingers.

Note: Do not drive the drum with the motor, and do not turn it clockwise.
Do not move the chamois leather vertically against the head tip; this can damage the head tip. Strictly follow the cleaning instructions above.

2-2. TAPE PATH CLEANING

1) Set the cassette compartment assembly to the eject state, or remove it. Then clean the tape path (guides No. 1 to 7, capstan shaft, pinch rollers) with a piece of chamois leather moistened in cleaning fluid (See Fig. 2-1).

2-3. DRIVE SYSTEM CLEANING

1) Clean the drive system (timing belt, reel table surface) with a piece of cloth moistened in cleaning fluid.

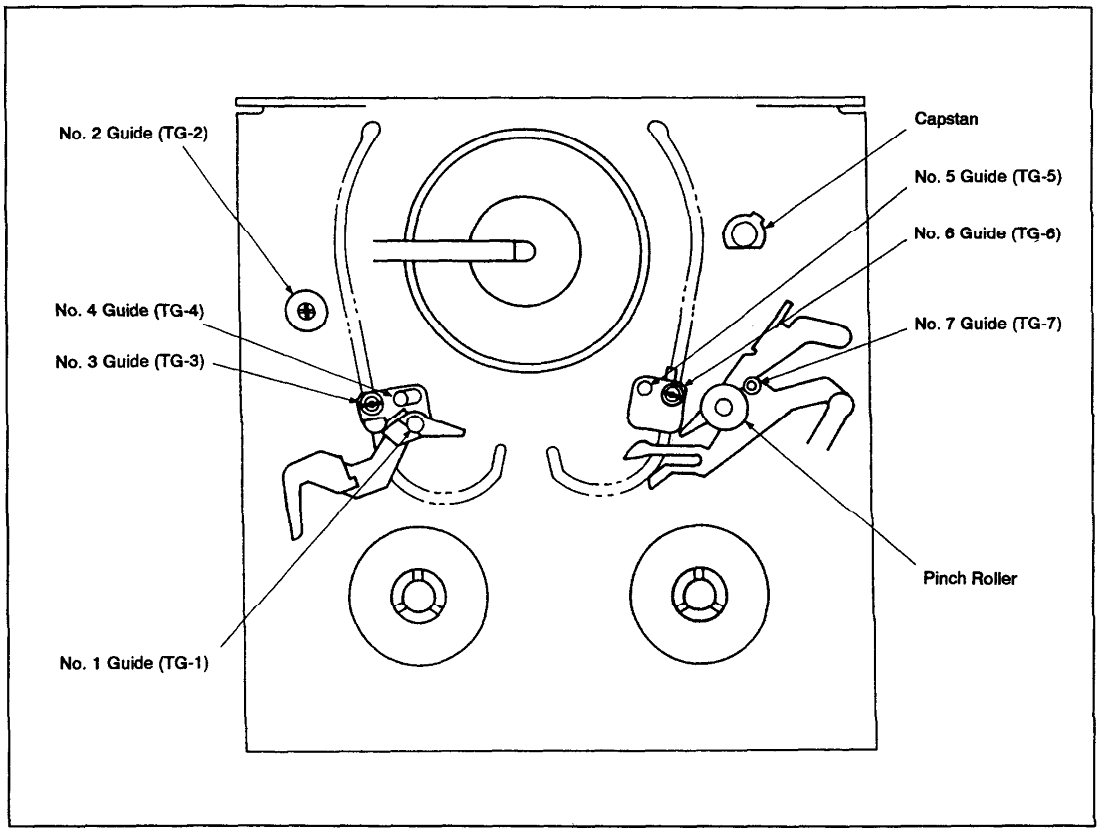


Fig. 2-1.

2-4. PERIODICAL CHECK ITEMS

○Cleaning ◎Lubrication ☆Check

Maintenance and Check Item		Operation time (H)										Remarks
		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	
Cleaning and Demag-netizing	Tape path surfaces Cleaning	○	○	○	○	○	○	○	○	○	○	Do not oil.
	Rotary drum assembly cleaning and demagnetizing	○	○	○	○	○	○	○	○	○	○	Do not oil.
Drive System	Relay belt (short)	–	☆	–	☆	–	☆	–	☆	–	☆	3-728-866-01
	Relay belt (long)	–	☆	–	☆	–	☆	–	☆	–	☆	3-728-865-01
	Capstan shaft	–	◎	–	◎	–	◎	–	◎	–	◎	Take care that no oil gets on tape path surfaces.
	Idler pulley axle	–	◎	–	◎	–	◎	–	◎	–	◎	
	Loading motor	–	☆	–	☆	–	☆	–	☆	–	☆	1-541-612-11
Perfor-mance Check	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	–	☆	–	☆	–	☆	–	☆	–	☆	
	Brake system	–	☆	–	☆	–	☆	–	☆	–	☆	
	FWD, RVS torque measurement	–	☆	–	☆	–	☆	–	☆	–	☆	

Notes: When overhauling the unit, perform parts replacement referring to the table above.

Regarding Oil:

- Always use the specified oil (using oil of different viscosity, etc. can cause troubles of several kinds).
  Specified oil: Part No. 7-661-018-01
  (Mitsubishi Diamond Oil Hydrofluid EP56)
- Be sure that no dirt is mixed in the oil to be used on axle bearings. Use of dirty oil can result in bearing wear and burning.
- By "one drop of oil" is meant the quantity of oil adhering to the end of a a 2mm-diameter rod as shown in Fig. 2-2.

On grease:

- Use the specified grease.
  Grease: Part No. 7-662-010-08
  (Sony grease SGL-701)

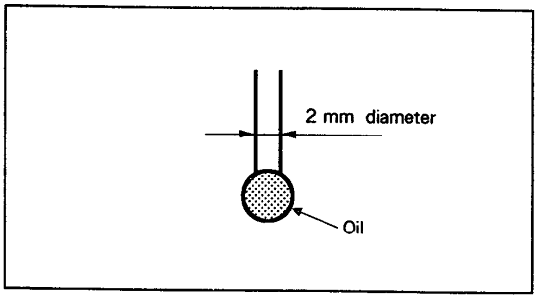


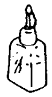
Fig. 2-2.

2-5. SERVICING TOOLS

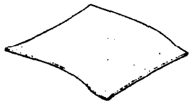
Ref. No.	Name	Part Code	Marking	Application, etc.
J-1	Cleaning fluid	Y-2031-001-0	–	
J-2	Chamois cloth	2-034-697-00	–	
J-3	Head demagnetizer	Commercially available	–	
J-4	Dental mirror Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-5	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-6	FWD/RVS takeup torque cassette	J-6080-624-A	GD-2086	
J-7	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-8	Mode selector III conversion connector	J-6082-021-A		General
J-9	Mode selector III panel	J-6082-023-A		General
J-10	Mode selector	J-6080-825-A		General
J-11	Hexagonal wrench detection (0.89 mm) or L wrench (0.89 mm)	7-700-766-01 7-700-736-06		Tape path
J-12	Sony grease (SGL-701)	7-662-010-08		

Other devices: Oscilloscope
Analog tester (20 kΩ)

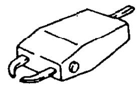
J-1



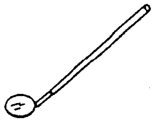
J-2



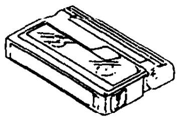
J-3



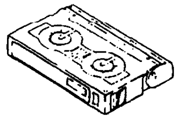
J-4



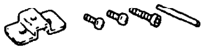
J-5



J-6

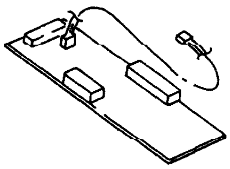


J-7

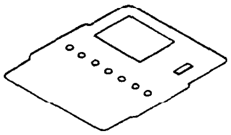


(Attached to the maintenance rotary upper drum)

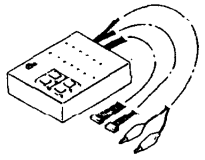
J-8



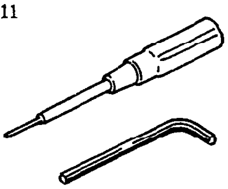
J-9



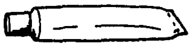
J-10



J-11



J-12



3. MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

Notes:
- Use the mode selector (Ref. No. J-10) for procedures in this chapter.
- Modes within a frame ☐ are those set by pressing the buttons of the mode selector.

3-1. HC ROLLER ASSEMBLY

1. Removal (See Fig. 3-1.)

1) Remove the screw ❶, then remove the HC roller assembly ❷.

2. Installation (See Fig. 3-1.)

1) Align the two dowels ❸ attached to the HC roller assembly ❷ with the two holes ❹ in the mechanism chassis.
2) Secure the HC roller assembly ❷ with the screw ❶.

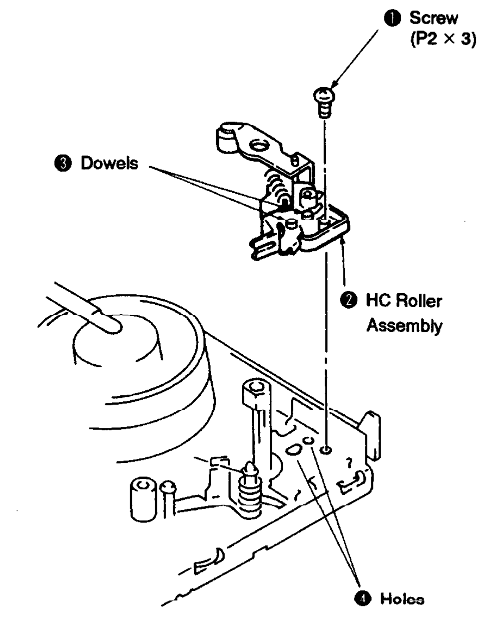

❶ Screw (P2 × 3)
❸ Dowels
❷ HC Roller Assembly
❹ Holes

Fig. 3-1.

3-2. GUIDE GUARD ASSEMBLY

1. Removal (See Fig. 3-2.)

Remove the screw ❶, then remove the guide guard assembly ❷.

2. Installation (See Fig. 3-2.)

1) Align the dowel ❸ attached to the guide guard assembly ❷ with the hole ❹.
2) Secure the guide guard assembly ❷ with the screw ❶.

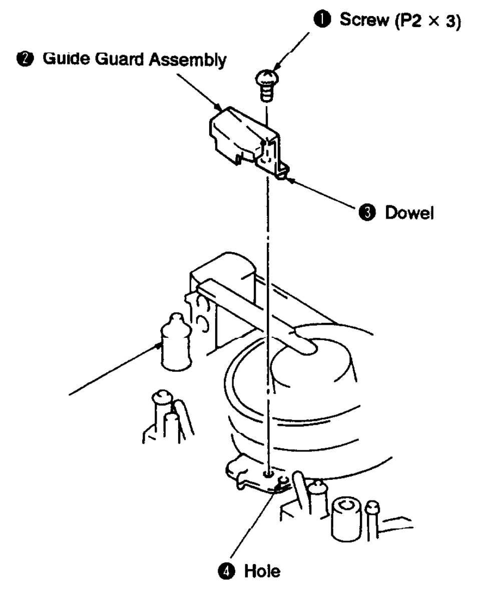

❶ Screw (P2 × 3)
❷ Guide Guard Assembly
❸ Dowel
❹ Hole

Fig. 3-2.

3-3. DC MOTOR (CAPSTAN MOTOR) ASSEMBLY

1. Removal (See Fig. 3-3.)

1) Set the ULD mode.
2) Turn the stopper ❶ in the direction of the arrow 🅐 as far as it will go.
3) Remove the two screws ❷, then remove the DC motor ❸.

2. Installation (See Fig. 3-3.)

1) Align the two screwed dowels ❹ with the two holes ❺, then engage the toothed part ❻ with the connecting gear ❼.
2) Secure the DC motor assembly ❸ with the two screws ❷.
3) Turn the stopper ❶ in the direction of the arrow 🅑 as far as it will go.

Note:
- When engaging the gears, take care not to damage their teeth.
- Do not leave any clearance between the DC motor ❸ and the chassis.
- Do not touch the capstan motor axle*, the oil seal* and the rotor*.

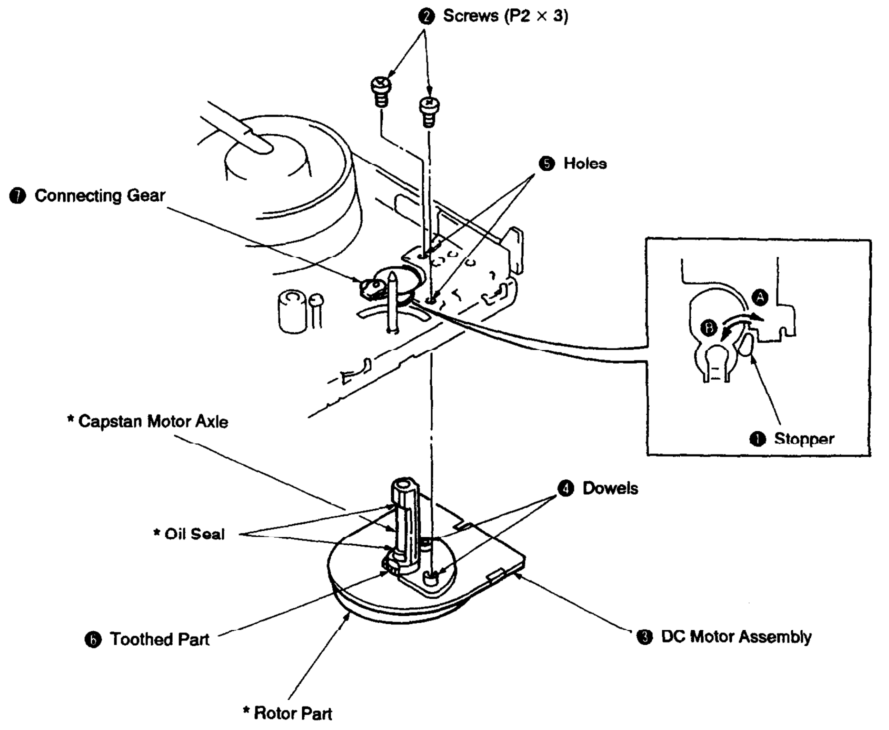

❷ Screws (P2 × 3)
❺ Holes
❼ Connecting Gear
🅐
🅑
❶ Stopper
* Capstan Motor Axle
❹ Dowels
* Oil Seal
❻ Toothed Part
❸ DC Motor Assembly
* Rotor Part

Fig. 3-3.

3-4. S BRAKE, T BRAKE

1. Removal (See Fig. 3-4.)

1) Remove the torsion coil spring (ST) ❶.
2) Remove the axle holding pin ❷, then remove the T brake ❸.
3) Remove the axle holding pin ❹, then remove the S brake ❺.

2. Installation (See Fig. 3-4.)

1) While fitting the toothed part ❻ into the notch ❼, mount the S brake ❺.
2) Insert the axle holding pin ❹.
3) Insert the axle ❽ to the S reel side of the brake release arm ❾ so that the Ⓐ part comes closer to the drum than part Ⓑ, and mount the T brake ❸.
4) Insert the axle holding pin ❷.
5) Insert the torsion coil spring (ST) ❶ below the claw ⓫ of the axle ❿, then hook it to two claws ⓬.

Note: Confirm that the claws of axle holding pins ❷ and ❹ are not broken before assembling.

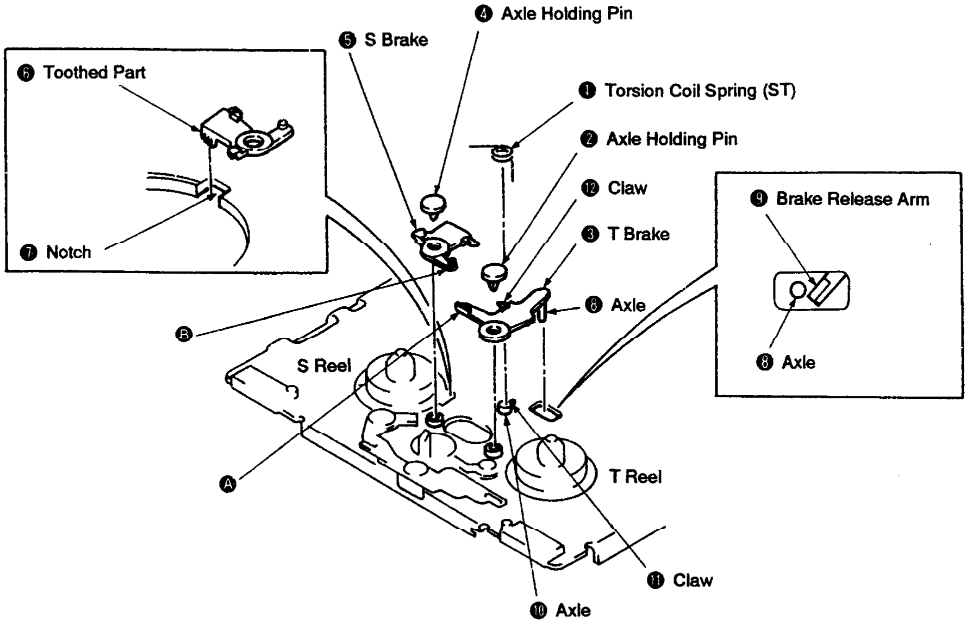

❹ Axle Holding Pin
❺ S Brake
❻ Toothed Part
❼ Notch
❶ Torsion Coil Spring (ST)
❷ Axle Holding Pin
⓬ Claw
❸ T Brake
❾ Brake Release Arm
❽ Axle
❽ Axle
Ⓑ
S Reel
Ⓐ
T Reel
⓫ Claw
❿ Axle

Fig. 3-4.

3-5. LB BRAKE, AXLE HOLDING PINS

1. Removal (See Fig. 3-5.)

1) Remove the screw ❶, then remove the TL holding plate ❷.
2) Remove the axle holding pin ❸, then remove the LB brake ❹.
3) Remove the axle holding pin ❺, then remove the LB lever ❻.

2. Installation (See Fig. 3-5.)

1) Mount the LB lever ❻ matching it to pin ❼ of the LB gear, then secure it with the axle holding pin ❺.
2) Insert the pin ❽ into the notch ❾ of the LB lever ❻, then mount the LB brake ❹ while inserting the toothed part ❿ into the notch ⓫.
3) Insert the axle holding pin ❸.
4) Align the dowel ⓬ with the hole ⓭, then mount the TL holding plate and secure it with the screw ❶.

Note: Confirm that the claws of axle holding pins ❸ and ❺ are not broken before assembling.

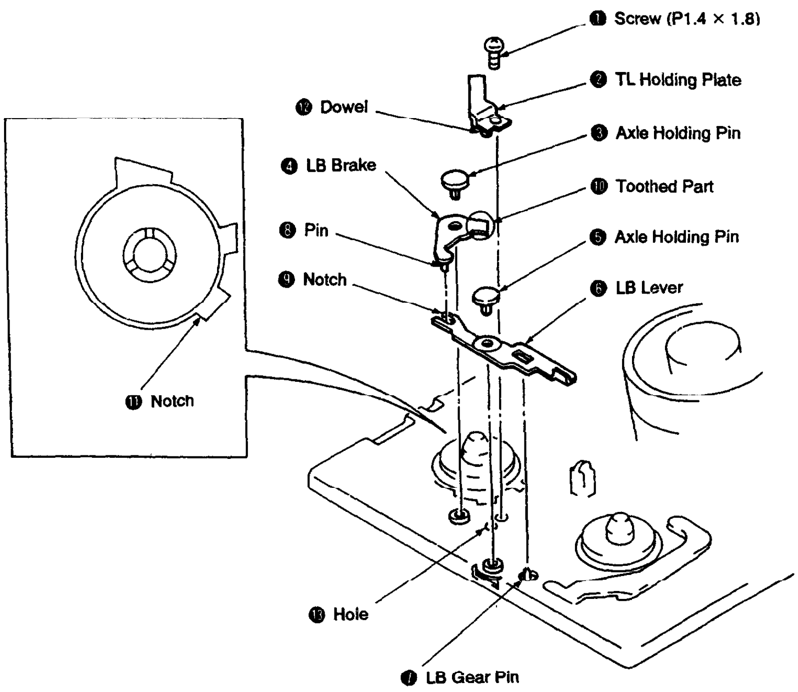

❶ Screw (P1.4 × 1.8)
❷ TL Holding Plate
⓬ Dowel
❸ Axle Holding Pin
❹ LB Brake
❿ Toothed Part
❽ Pin
❺ Axle Holding Pin
❾ Notch
❻ LB Lever
⓫ Notch
⓭ Hole
❼ LB Gear Pin

Fig. 3-5.

3-6. LB RELEASE ARM

1. Removal (See Fig. 3-6.)

1) While pushing the claw ❶ in the direction of the arrow, remove the LB release arm ❷.

2. Installation (See Fig. 3-6.)

1) Fit the LB release arm ❷ to the axle ❸, insert protrusions ⓐ, ⓑ, ⓒ, ⓓ into the three holes ❹, then secure with the claw ❶.

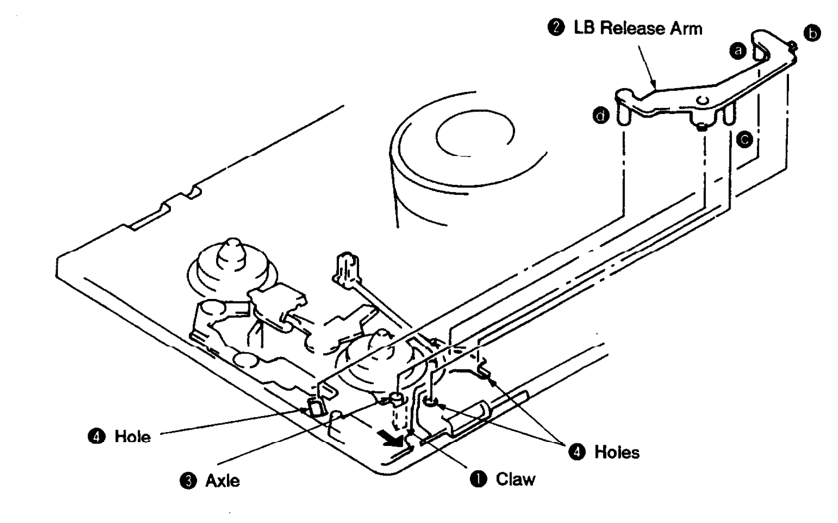

❷ LB Release Arm
ⓐ
ⓑ
ⓓ
ⓒ
❹ Hole
❸ Axle
❶ Claw
❹ Holes

Fig. 3-6.

3-7. RK STOPPER, RK STOPPER ARMS

1. Removal (See Fig, 3-7.)

1) Remove the torsion coil spring (RK) ❶.
2) Open the chassis claw ❷, then remove the RK stopper arm ❸.
3) Remove the RK stopper ❹.

2. Installation (See Fig. 3-7.)

1) Mount the RK stopper ❹ onto the axle ❺.
2) Mount the RK stopper arm ❸ onto the axle ❻, insert Pin ❿ into hole ⓫, then hook the claw ❷ of the chassis to the hole ❼.
3) Insert the torsion coil spring (RK) ❶ into the axle ❺, then hook it to claws ❽ and ❾.

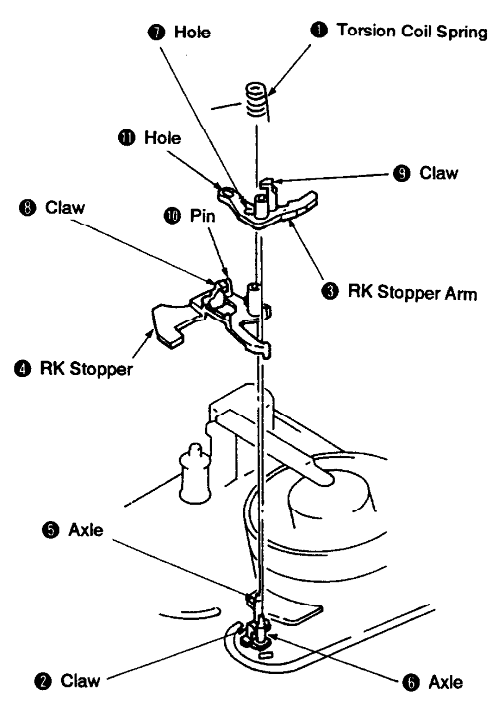

❼ Hole
❶ Torsion Coil Spring
⓫ Hole
❾ Claw
❽ Claw
❿ Pin
❸ RK Stopper Arm
❹ RK Stopper
❺ Axle
❷ Claw
❻ Axle

Fig. 3-7.

3-8. PINCH ARM ASSEMBLY, TG-7 ASSEMBLY

1. Removal (See Fig. 3-8.)

1) Set the $\boxed{\text{IB}}$ mode.
2) Remove the stopper washer ❶, then remove the pinch arm assembly ❷.
3) Bend the claw ❹ inside hole ❸ in the direction of the arrow using a thin screwdriver or the like, then remove the TG-7 plate spring ❺.
4) Remove the TG-7 arm assembly ❻.

2. Installation (See Fig. 3-8.)

1) Grease the inner surfaces of hole ❼ (See Fig. A).
2) Insert the axle ❽ of the TG-7 arm assembly ❻ into the hole ❼.
3) Grease the shaded section ⓐ (See Fig. A).
4) Insert the TG-7 plate spring ❺ into the hole ❸, then secure it with the claw ❹.
5) Apply half a drop of oil to the axle ❾ (See Fig. B).
6) Fit the pinch arm assembly ❷ to the axle ❾ and insert the pinch roller sub arm assembly tab ❿ into the ⓑ part.
7) Install the stopper washer ❶.

Note:
- Take care not to grease the screw ⓫ of the TG-7 arm assembly ❻ (See Fig. A).
- When fitting the pinch arm assembly ❷ to the axle ❾, make sure that it does not touch the TG-7 guide ⓬ or the rubber roller ⓭.
- After assembling, be sure to perform tape path adjustment as described in section 4.

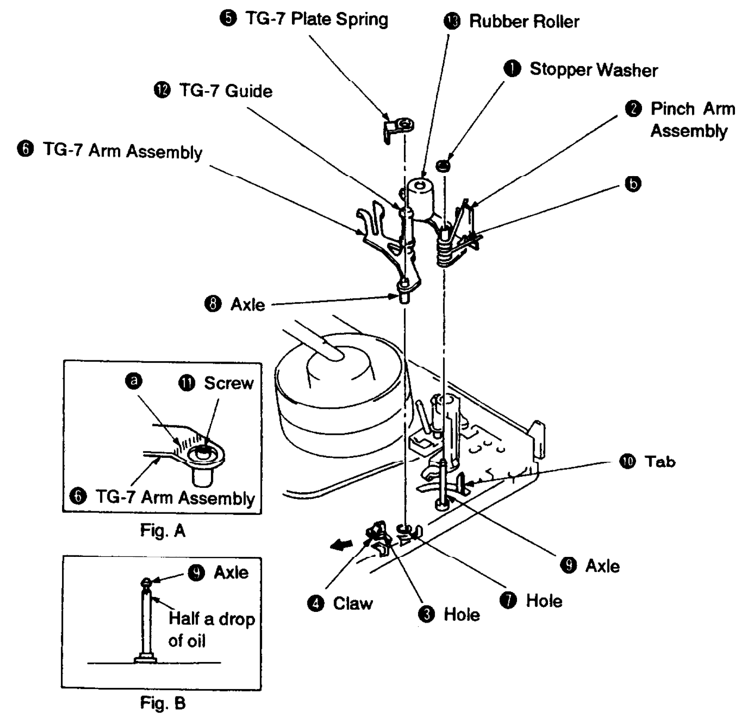

❺ TG-7 Plate Spring
⓭ Rubber Roller
❶ Stopper Washer
⓬ TG-7 Guide
❷ Pinch Arm Assembly
❻ TG-7 Arm Assembly
ⓑ
❽ Axle
ⓐ
⓫ Screw
❻ TG-7 Arm Assembly
Fig. A
❿ Tab
❾ Axle
Half a drop of oil
Fig. B
❾ Axle
❹ Claw
❸ Hole
❼ Hole

Fig. 3-8.

3-9. TG-2 ASSEMBLY

1. Removal (See Fig. 3-9.)

1) Remove the TG-2 upper flange assembly ❶.
2) Remove the TG-2 roller ❷, the TG-2 sleeve ❸, the TG-2 lower flange ❹ and the compression spring ❺.

2. Installation (See Fig. 3-9.)

1) Mount the compression spring ❺, the TG-2 lower flange ❹, the TG-2 sleeve ❸ and the TG-2 roller ❷ to the axle.
2) Secure the TG-2 upper flange ❶ to the axle by rotating it 4 to 6 turns.

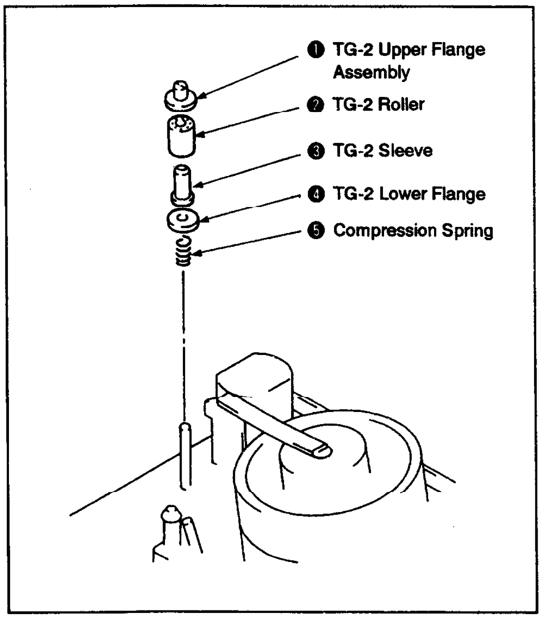

❶ TG-2 Upper Flange Assembly
❷ TG-2 Roller
❸ TG-2 Sleeve
❹ TG-2 Lower Flange
❺ Compression Spring

Fig. 3-9.

3. TG-2 Height Preset (see Fig. 3-10.)

1) Adjust height from the mechanism chassis upper surface to the TG-2 upper flange ❶ upper surface to 18.6 mm by turning the TG-2 upper flange ❶.

Note: After adjustment, be sure to perform tape path adjustment as described in section 4.

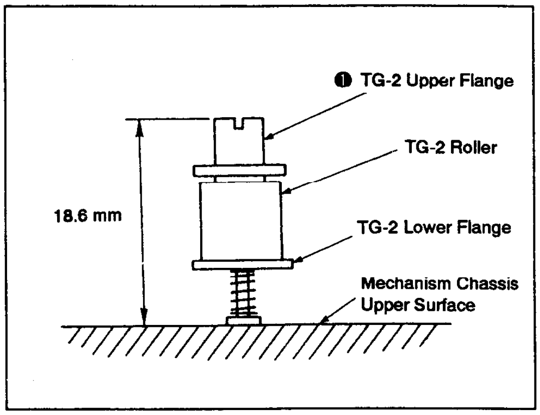

❶ TG-2 Upper Flange
TG-2 Roller
18.6 mm
TG-2 Lower Flange
Mechanism Chassis Upper Surface

Fig. 3-10.

3-10. S REEL TABLE ASSEMBLY, T REEL TABLE ASSEMBLY

1. Removal (See Fig. 3-11.)

1) Remove the S brake and T brake as described in section 3-4.
2) Remove the TL holding plate as described in section 3-5.
3) Remove the tension regulator band assembly as described in section 3-11.
4) Remove the S reel table assembly ❶.
5) Turn the stopper ❷ approx. 90 ° in the direction of the arrow Ⓐ.
6) While sliding the LB release arm ❸ in the direction of the arrow Ⓑ, remove the T reel table assembly ❹.

2. Installation (See Fig. 3-11.)

1) Apply half a drop of oil to the axle ❺ (See Fig. A).
2) Move the RK gear ❻ in the direction of the arrow Ⓒ and the TS brake ❼ in the direction of the arrow Ⓓ, putting them out of the way.
3) While sliding the LB release arm ❸ in the direction of the arrow Ⓑ, mount the T reel table assembly ❹ onto the axle ❺, then turn the stopper ❷ in the direction of the arrow Ⓔ as far as it will go.
4) Apply half a drop of oil to the axle ❽ (See Fig. B).
5) Move the RK gear ❻ in the direction of the arrow Ⓕ, the UL brake ❾ in the direction of the arrow Ⓖ and the LB brake ❿ in the direction of the arrow Ⓗ, putting them out of the way.
6) Mount the S reel table ❶ onto the axle ❽.
7) Mount the tension regulator band assembly as described in section 3-11.
8) Mount the TL holding plate as described in section 3-5.
9) Mount the S brake and T brake assemblies as described in section 3-4.

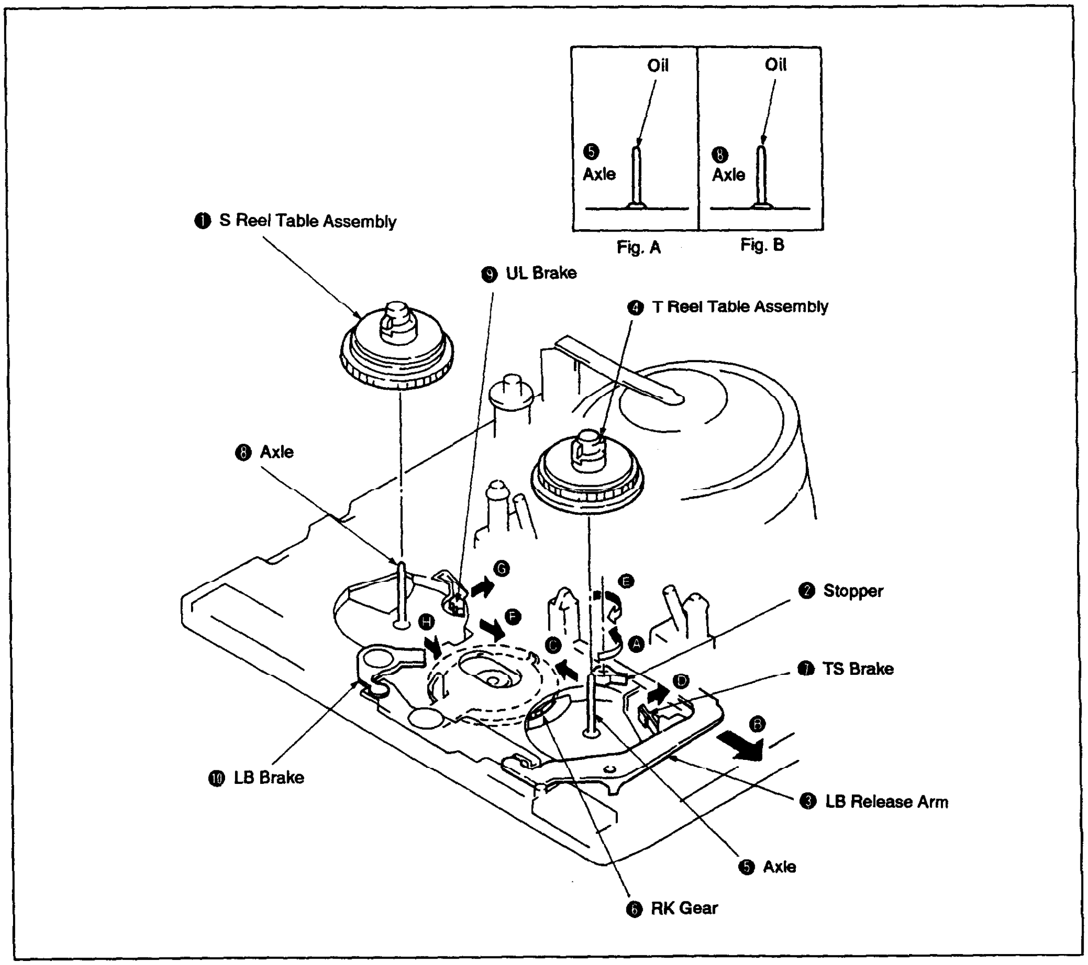

Oil
Oil
❺ Axle
❽ Axle
Fig. A
Fig. B
❶ S Reel Table Assembly
❾ UL Brake
❹ T Reel Table Assembly
❽ Axle
Ⓖ
Ⓔ
❷ Stopper
Ⓕ
Ⓗ
Ⓒ
Ⓐ
Ⓓ
❼ TS Brake
Ⓑ
❿ LB Brake
❸ LB Release Arm
❺ Axle
❻ RK Gear

Fig. 3-11.

3-11. TENSION REGULATOR BAND ASSEMBLY, TENSION REGULATOR ARM ASSEMBLY

1. Removal (See Fig. 3-12.)

1) Remove the TL holding plate as described in section 3-5.
2) Remove the screw ❶.
3) Using a thin screwdriver or the like, remove the tension regulator band assembly ❹ from the axle ❸ of tension regulator arm assembly ❷.
4) Remove the tension spring ❺.
5) Remove the stopper washer ❻ from the back of the mechanism chassis, then remove the tension regulator arm assembly ❷.
6) Open the claw ❼, then remove the adjust arm ❽.

Note: When removing the tension regulator band assembly ❹, take care not to twist or bend it, and not to touch the felt surface ❾.

2. Installation (See Fig. 3-12.)

1) Engage the adjust arm ❽ in the position shown in Fig. A, then close the claw ❼.
2) Apply half a drop of oil to the hole ❿.
3) Mount the tension regulator arm assembly ❷, then insert it into the slot ⓫ so that the ⓐ part comes to the arrow Ⓐ side of the switch lever assembly (See Fig. B).
4) While holding the tension regulator arm assembly ❷ from the mechanism chassis front, secure it with the stopper washer ❻ from the back.
5) Hook the R hook of the tension spring ❻ to the adjust arm ❽ as shown in the figure, then hook the opposite end to the tension regulator arm assembly ❷.
6) Mount the tension regulator band assembly ❹ onto the axle ❸ of tension regulator arm assembly ❷, and place it so that the felt surface ❾ comes against the shaded portion of the S reel table assembly ⓬.
7) Mount the tension regulator plate ⓭ of the tension regulator band assembly ❹ so that it is aligned with the dowel ⓮ of the mechanism chassis, then secure it temporarily with the screw ❶.
8) Mount the TL holding plate as described in section 3-5.
9) Adjust tension regulator FWD position as described in section 3-12.
10) Perform adjust arm adjustment as described in section 3-22.

Note: When mounting the tension regulator band assembly ❷, take care not to twist or bend it, and not to touch the felt surface ❾.

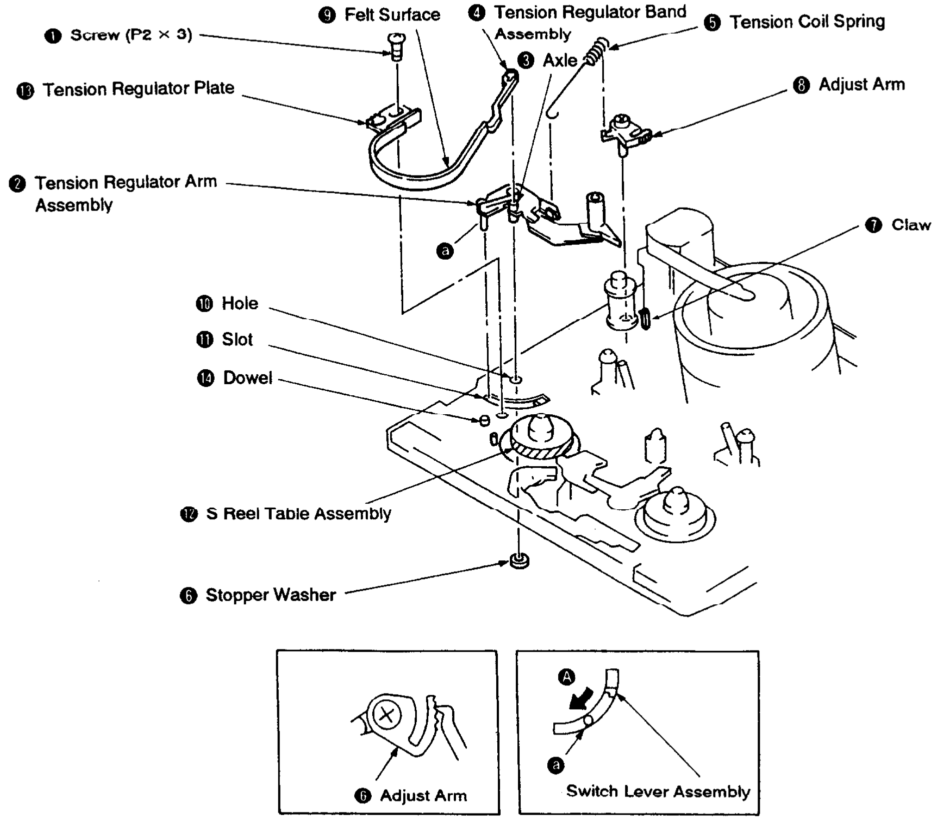

❶ Screw (P2 × 3)
❾ Felt Surface
❹ Tension Regulator Band Assembly
❸ Axle
❺ Tension Coil Spring
⓭ Tension Regulator Plate
❽ Adjust Arm
❷ Tension Regulator Arm Assembly
ⓐ
❼ Claw
❿ Hole
⓫ Slot
⓮ Dowel
⓬ S Reel Table Assembly
❻ Stopper Washer
❻ Adjust Arm
Ⓐ
ⓐ
Switch Lever Assembly

Fig. A

Fig. B

Fig. 3-12.

3-12. TENSION REGULATOR FWD POSITION PRESET (See Fig. 3-13.)

1) Load a cassette tape and set the FWD mode.
2) Confirm whether the distance between ⓐ part of the tension regulator arm ❶ and the groove ❷ of the chassis is 1.1 ± 0.3 mm. If this distance is not within the specified range, remove the cassette tape and perform the following adjustment.
3) Loosen the fixing screw ❹ of the tension regulator band assembly ❸.
4) Slide the tension regulator plate ❺ in the direction of the arrow 🅐 if the measured distance is over the specified range, and in the direction of the arrow 🅑 if it is under that range. Then, fix it with the screw ❹.
5) Repeat steps 1) and 2) and confirm that the distance is within the specified range.

Note: Use a cassette with the tape advanced halfway.

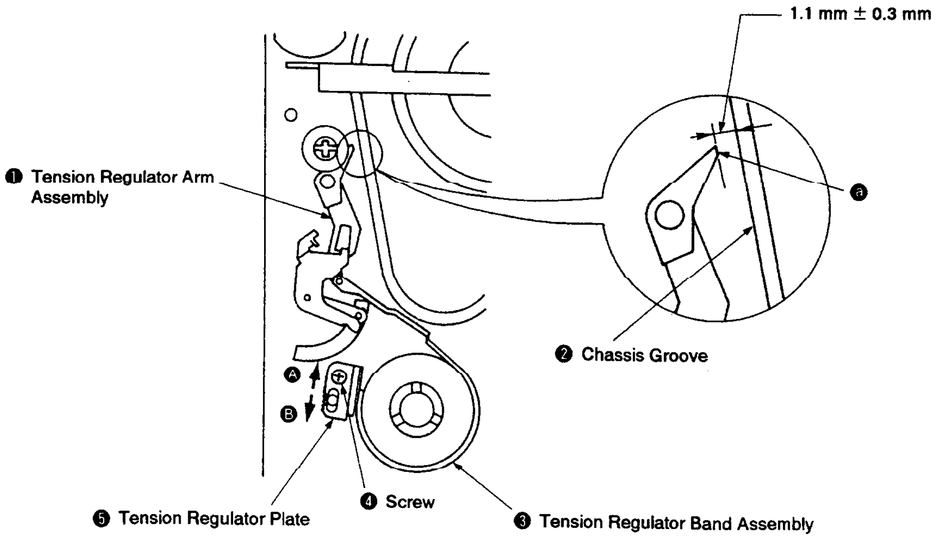

1.1 mm ± 0.3 mm
❶ Tension Regulator Arm Assembly
ⓐ
❷ Chassis Groove
🅐
🅑
❹ Screw
❺ Tension Regulator Plate
❸ Tension Regulator Band Assembly

Fig. 3-13.

3-13. DRUM ASSEMBLY, DEW SENSOR

1. Removal (See Fig. 3-14.)

1) Set the EJECT mode.
2) Remove the flexible board ❶ and the two connectors ❷.
3) Remove the guide guard assembly as described in section 3-2.
4) Remove the screw ❸, then remove the axle ground terminal ❹.
5) Remove the three screws ❺, then remove the drum assembly ❻ from the mechanism chassis.
6) Remove the connector ❿
7) Remove the screw ❼, then remove the dew sensor ❽.

Note:
- When removing the drum assembly ❻ from the mechanism chassis, take care not to cut the flexible board ❶ or the harness.
- Take care not to touch the head tip ❾.

2. Installation (See Fig. 3-14.)

1) Insert part ⓐ of the dew sensor ❽ into the notch ⓫ of the mechanism chassis, then secure it with the screw ❼.
2) Mount the connector ❿.
3) Clamp the harness ⓯ of the dew sensor ❽ with the reinforcing the claw ⓰ of the plate SS assembly (See Fig. A).
4) Insert the connector ❷ and the flexible board ❶ into the hole ⓬ of the mechanism chassis, align the drum assembly ❻ with the two dowels ⓭ and secure it with the three screws ❺.
5) Align the axle ground terminal ❷ with the two dowels ⓮ of the mechanism chassis and secure it with the screw ❸.
6) Mount the guide guard assembly as described in section 3-2.
7) Mount the two connectors ❷ and the flexible board ❶.

Note:
- Take care not to cut the flexible board ❶ or the harness ⓯.
- Take care not to touch the head tip ❾.
- After assembling, be sure to perform Tape Path Adjustment following instructions in section 4.

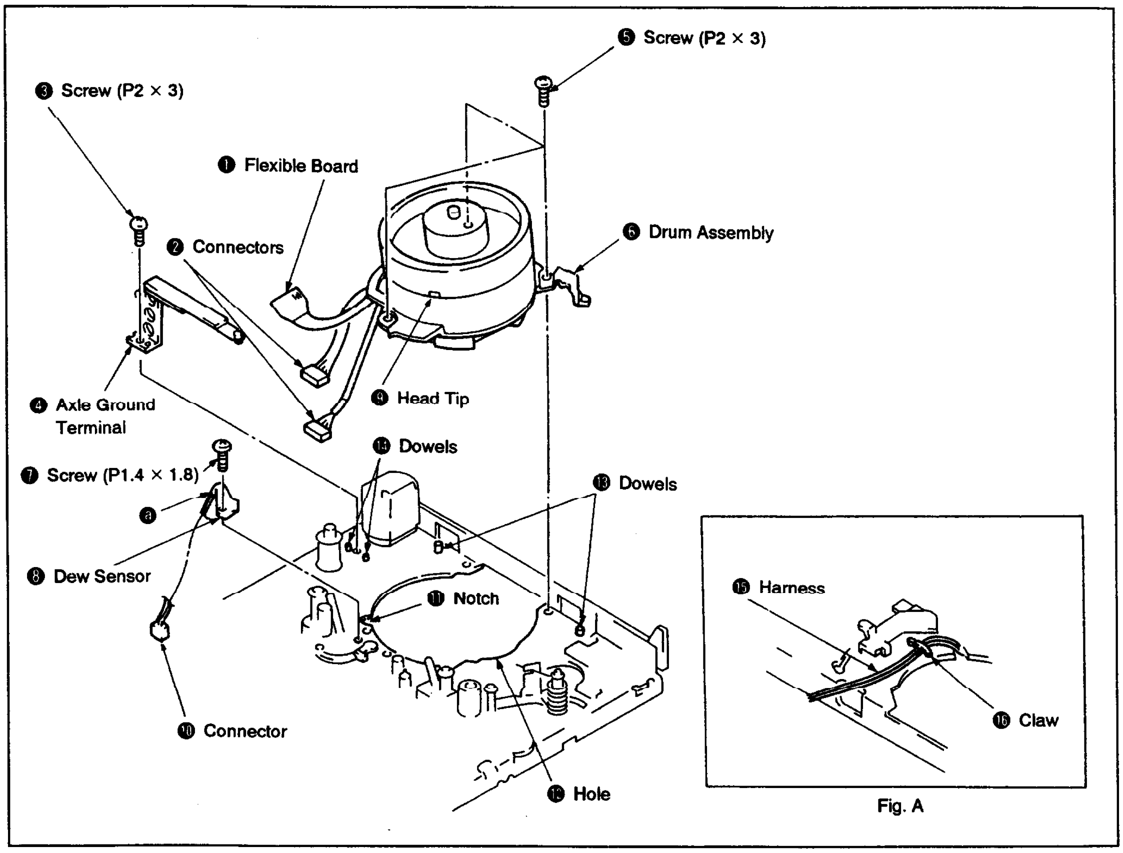

❺ Screw (P2 × 3)
❸ Screw (P2 × 3)
❶ Flexible Board
❷ Connectors
❻ Drum Assembly
❹ Axle Ground Terminal
❾ Head Tip
⓮ Dowels
❼ Screw (P1.4 × 1.8)
ⓐ
⓭ Dowels
❽ Dew Sensor
⓫ Notch
⓯ Harness
⓰ Claw
❿ Connector
⓬ Hole
Fig. A

Fig. 3-14.

3-14. EJECT LEVER, SWITCH LEVER ASSEMBLY, PINCH ROLLER SUB ARM ASSEMBLY

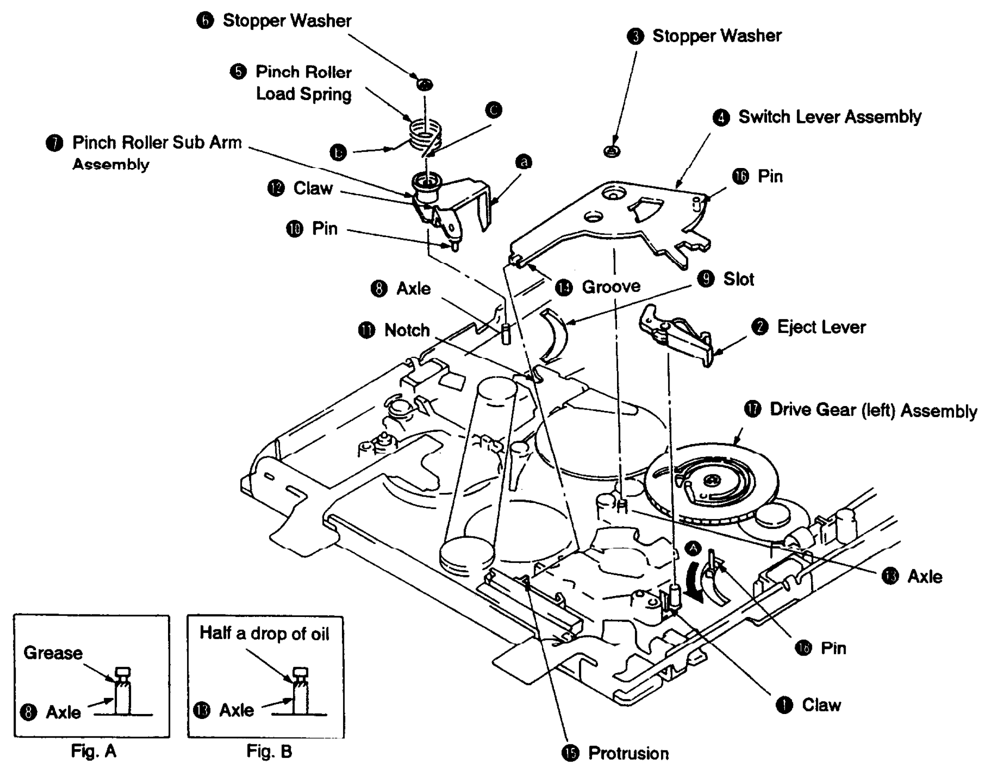
1. Removal (See Fig. 3-15.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Set the STOP mode.
3) Remove the claw ①, then remove the eject lever ②.
4) Remove the stopper washer ③, then remove the switch lever assembly ④.
5) Remove the pinch roller load spring ⑤.
6) Remove the stopper washer ⑥, then remove the pinch roller sub arm assembly ⑦.

2. Installation (See Fig. 3-15.)

1) Grease the axle ⑧ (See Fig. A).
2) Assemble by inserting ⓐ part of the pinch roller sub arm assembly ⑦ into the slot ⑨, then insert the pin ⑩ into the loading lever assembly notch ⑪.
3) Secure with the stopper washer ⑥.
4) Mount the pinch roller load spring ⑤ by catching its ⓑ end between the claw ⑫ and the chassis side and its ⓒ end to the claw ⑫.
5) Apply half a drop of oil to the axle ⑬ (See Fig. B).
6) Align the groove ⑭ of the switch lever assembly ④ with the mode detector switch protrusion ⑮, mount it on the axle ⑬, then insert the pin ⑯ into the drive gear (left) assembly ⑰ outer groove.
7) Secure with the stopper washer ③.
8) Mount the eject lever ② and close the claw ①.
9) Mount the DC motor (capstan motor) as described in section 3-3.

Note: When mounting the switch lever assembly ④ onto the axle ⑬ with the tension regulator arm assembly installed, set the pin ⑯ to the arrow Ⓐ side of the switch lever assembly ④.



⑥ Stopper Washer
⑤ Pinch Roller Load Spring
ⓒ
⑦ Pinch Roller Sub Arm Assembly
ⓑ
ⓐ
⑫ Claw
⑩ Pin
⑧ Axle
⑪ Notch
③ Stopper Washer
④ Switch Lever Assembly
⑯ Pin
⑭ Groove
⑨ Slot
② Eject Lever
⑰ Drive Gear (left) Assembly
Ⓐ
⑬ Axle
⑯ Pin
① Claw
⑮ Protrusion
Grease
⑧ Axle
Half a drop of oil
⑬ Axle

Fig. A

Fig. B

Fig. 3-15.

3-15. TIMING BELT (L) , RC GEAR ASSEMBLY, LOADING LEVER ASSEMBLY, TIMING BELT (S), CONNECTING GEAR ASSEMBLY

1. Removal (See Fig. 3-16.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the pinch roller sub arm assembly as described in section 3-14.
3) Set the STOP mode.
4) Remove the stopper washer ❶ , then remove the RC gear assembly ❷ from the axle ❹ with the timing belt (L) ❸ attached.
5) Remove the timing belt (L) ❸ from the idler pulley assembly ❺.
6) Remove the stopper washer ❻ and remove the loading lever assembly ❽ while pushing the claw ❼ in the direction of the arrow Ⓐ.
7) Turn the stopper ❾ approx. 90 ° in the direction of the arrow Ⓑ.
8) Remove the connecting gear assembly ⓫ from the axle ⓰ with the timing belt (S) ❿ attached.
9) Remove the timing belt (S) ❿ from the idler pulley assembly ❺.

Note: When removing the connecting gear ⓫ , take care not touch the flange section ⓑ.

2. Installation (See Fig. 3-16.)

1) Apply half a drop of oil to the axle ⓰ (See Fig. F).
2) Hook one end of the timing belt (S) ❿ onto the connecting gear assembly ⓫ and the other end onto gear ⓓ of the idler pulley assembly ❺. (Refer to the figure.)
3) Mount the connecting gear assembly ⓫ with the timing belt (S) ❿ attached to the axle ⓰.
4) Turn the stopper ❾ in the direction of the arrow Ⓒ as far as it will go.
5) Apply half a drop of oil to the axle ⓬ (See Fig. A).
6) Fit the loading lever assembly ❽ to the axle ⓬, secure the ⓐ part with the claw ❼ and place the pin ⓭ into the groove of the drive gear (right) assembly ⓮.
7) Install the stopper washer ❻.
8) Place the timing belt (L) ❸ around the gears of the RC gear assembly ❷ indicated in Fig. B, and its opposite side around the gear ⓒ of the idler pulley assembly ❺. (See Fig. E.)
9) Mount the RC gear assembly ❷ onto the axle ❹ with the timing belt (L) ❸ attached, and engage it with the gear of the RK gear assembly ⓯.
10) Install the stopper washer ❶.
11) Grease parts of the loading lever assembly ❽ indicated in Fig. C.
12) Mount the pinch roller sub arm assembly as described in section 3-14.
13) Mount the DC motor (capstan motor) as described in section 3-3.

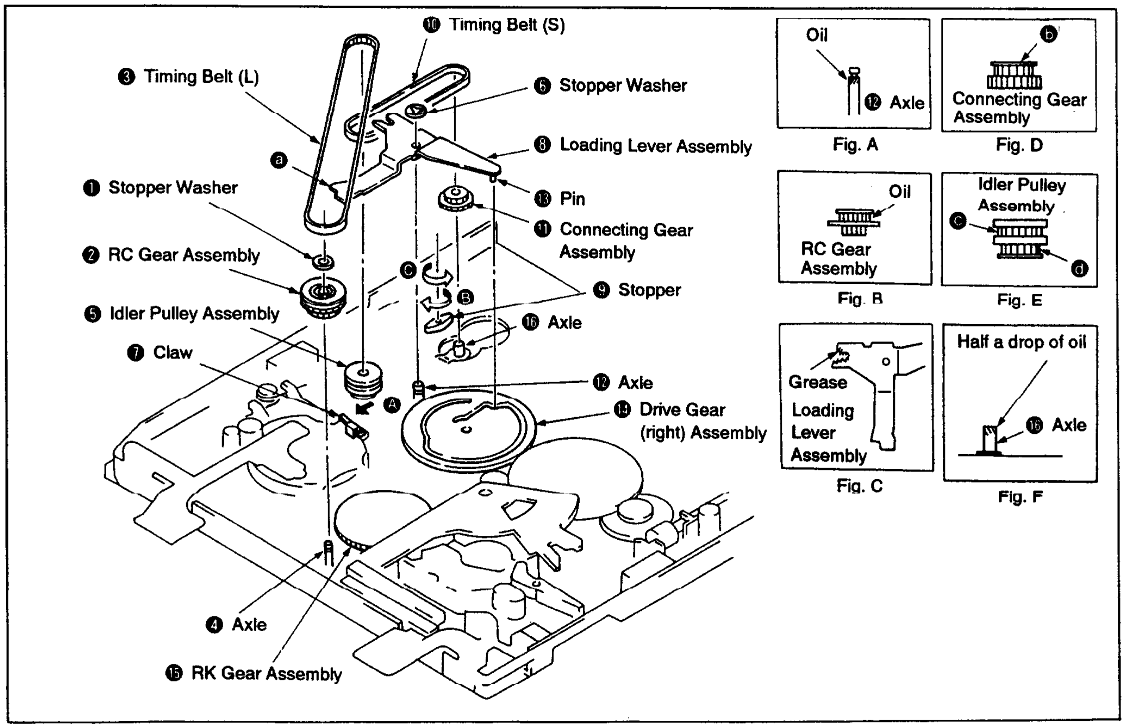

❿ Timing Belt (S)
❸ Timing Belt (L)
❻ Stopper Washer
❽ Loading Lever Assembly
ⓐ
❶ Stopper Washer
⓭ Pin
⓫ Connecting Gear Assembly
❷ RC Gear Assembly
Ⓒ
❾ Stopper
Ⓑ
❺ Idler Pulley Assembly
⓰ Axle
❼ Claw
⓬ Axle
Ⓐ
⓮ Drive Gear (right) Assembly
❹ Axle
⓯ RK Gear Assembly
Oil
⓬ Axle
Fig. A
ⓑ
Connecting Gear Assembly
Fig. D
Oil
RC Gear Assembly
Fig. B
Idler Pulley Assembly
ⓒ
ⓓ
Fig. E
Grease
Loading Lever Assembly
Fig. C
Half a drop of oil
⓰ Axle
Fig. F

Fig. 3-16.

3-16. IDLER PULLEY, TS BRAKE ASSEMBLY, LB GEAR ASSEMBLY, RK GEAR ASSEMBLY

1. Removal (See Fig. 3-17.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the switch lever assembly as described in section 3-14.
3) Remove the timing belt (L), the RC gear assembly, the loading lever assembly, the timing belt (S) and the connecting gear assembly described in section 3-15.
4) Set the STOP mode.
5) Remove the stopper washer ❶, then remove the idler pulley ❷.
6) Open the claw ❸, then remove the TS brake assembly ❹.
7) Remove the torsion coil spring (LB) ❺.
8) Remove the stopper washer ❻, then remove the LB gear assembly ❼.
9) Remove the RK gear assembly ❽.

Note: When removing the idler pulley ❷, take care not to touch the flange section ⓐ. (See Fig. C.)

2. Installation (See Fig. 3-17.)

1) Apply half a drop of oil to the axle ❾ (See Fig. A).
2) Mount the RK gear assembly ❽ onto the axle ❾, keeping it in horizontal position.
3) Apply half a drop of oil to the axle ❿ (See Fig. B).
4) Mount the LB gear assembly ❼ onto the axle ❿ and secure it with the stopper washer ❻.
5) Insert the torsion coil spring (LB) ❺ into the axle ⓫, then hook it to the mechanism chassis notch ⓬ and to the tab ⓭.
6) Mount the TS brake assembly ❹ and close the claw ❸.
7) Apply half a drop of oil to the axle ⓰ (See Fig. D).
8) Mount the idler pulley ❷ onto the axle ⓰, then secure it with the stopper washer ❶.
9) Mount the timing belt (L), the RC gear assembly, the loading lever assembly, the timing belt (S) and the connecting gear assembly as described in section 3-15.
10) Mount the switch lever assembly as described in section 3-14.
11) Mount the DC motor (capstan motor) as described in section 3-3.

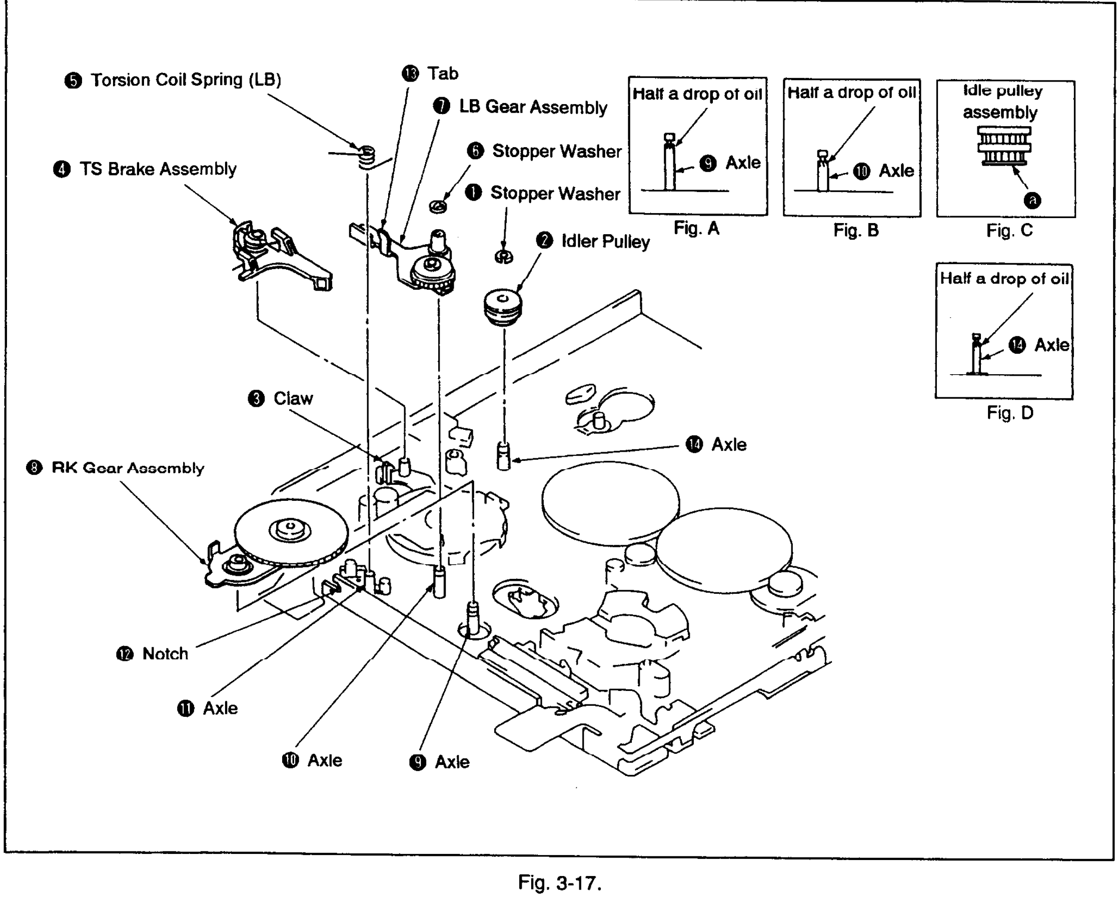

❺ Torsion Coil Spring (LB)
⓭ Tab
❼ LB Gear Assembly
❻ Stopper Washer
❹ TS Brake Assembly
❶ Stopper Washer
❷ Idler Pulley
❸ Claw
❽ RK Gear Assembly
⓮ Axle
⓬ Notch
⓫ Axle
❿ Axle
❾ Axle
Half a drop of oil
❾ Axle
Half a drop of oil
❿ Axle
Idle pulley assembly
ⓐ
Half a drop of oil
⓮ Axle

Fig. A Fig. B Fig. C Fig. D

Fig. 3-17.

3-17. UL GEAR, UL BRAKE, UL ARM, LB PLATE SPRING

1. Removal (See Fig. 3-18.)

1) Remove the switch lever assembly as described in section 3-14.
2) Remove the stopper washer ❶, then remove the UL gear ❷.
3) Remove the UL arm ❸, the 1.6 mm-diameter poly washer ❹ and the LB plate spring ❺.
4) Remove the UL brake ❻.

2. Installation (See Fig. 3-18.)

1) Mount the UL brake ❻.
2) Apply half a drop of oil to the axle ❼ (See Fig. A).
3) Mount the LB plate spring ❺ to the axle ❼ as shown in Fig. B, then install the 1.6mm-diameter poly washer ❹.
4) Mount the UL arm ❸ to the axle ❼ so that the protrusion ❽ comes into the groove ❾ of the UL brake ❻.
5) Mount the UL gear ❷ to the axle ❼ and engage it with the gear of the drive gear (left) assembly ❿.
6) Install the stopper washer ❶.
7) Mount the switch lever assembly as described in section 3-14.

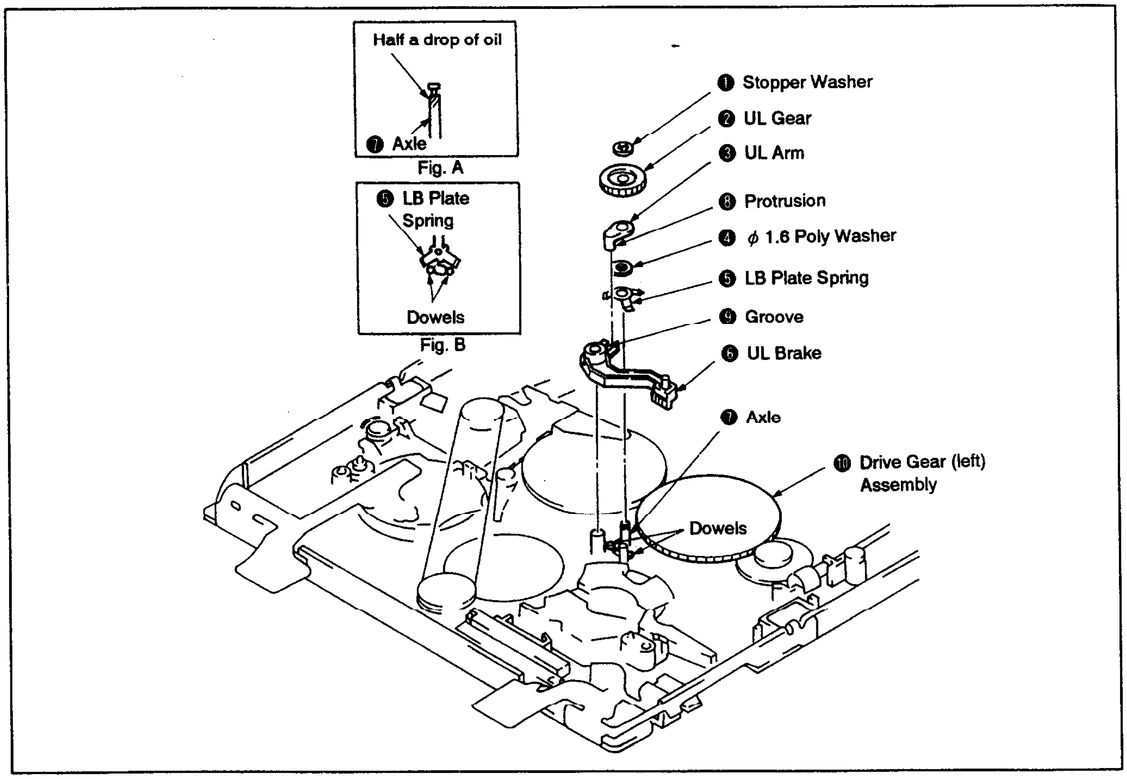

Half a drop of oil
❼ Axle
Fig. A
❺ LB Plate Spring
Dowels
Fig. B
❶ Stopper Washer
❷ UL Gear
❸ UL Arm
❽ Protrusion
❹ ϕ 1.6 Poly Washer
❺ LB Plate Spring
❾ Groove
❻ UL Brake
❼ Axle
❿ Drive Gear (left) Assembly
Dowels

Fig. 3-18.

3-18. COASTER (RIGHT) ASSEMBLY, DRIVE GEAR (RIGHT) ASSEMBLY

1. Removal (See Fig. 3-19.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the drum unit as described in section 3-13.
3) Remove the switch lever assembly as described in section 3-14.
4) Remove the timing belt (L) , the RC gear assembly and the loading lever assembly as described in section 3-15.
5) Set the STOP mode.
6) Remove the screw ❶ , then remove the coaster plate spring ❷ and the coaster (right) assembly ❸ .
7) Remove the two screws ❹ , then remove the reinforcing plate TT ❺ .
8) Remove the stopper washer 1.5 ❻ , then remove the drive gear (right) assembly ❼ .

2. Installation (See Fig. 3-19.)

1) Grease the points of the mechanism chassis shown in Fig A.
2) Apply half a drop of oil to the axle ❽ (See Fig. F).
3) Grease pin ❾ , axle ❿ and dowel ⓯ of the coaster (right) assembly ❸ (See Fig. D).
4) Mount by aligning the pin ❾ and the axle ❿ with the slot ⓫ of the mechanism chassis.
5) Move the brake release arm ⓬ in the direction of the arrow Ⓐ to put it out of the way.
6) Mount the drive gear (right) assembly ❼ to the axle ❽ , and engage it with the drive gear (left) assembly ⓭ as shown in Fig. B.
7) Align the ⓐ part with the ⓑ part, and the hole ⓮ with the pin ❾ of the coaster (right) assembly ❸ .
8) Install the stopper washer 1.5 ❻ .
9) Mount by aligning the coaster plate spring ❷ with the axle ❿ of the coaster (right) assembly ❸ and pin ❾ , then secure with the screw ❶ .
10) Mount the reinforcing plate TT ❺ aligning it with the dowel ⓯ , then tighten the two screws ❹ in the indicated order.
11) Grease the points indicated in Figs. C and E.
12) Mount the timing belt (L) , the RC gear assembly and the loading lever assembly as described in section 3-15.
13) Mount the switch lever assembly as described in section 3-14.
14) Mount the drum unit as described in section 3-13.
15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:
- Screw ❶ should be tightened with a tightening torque of approx. 500g•cm. If tightened too much, the coaster (right) assembly ❸ and the coaster plate spring ❷ will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.

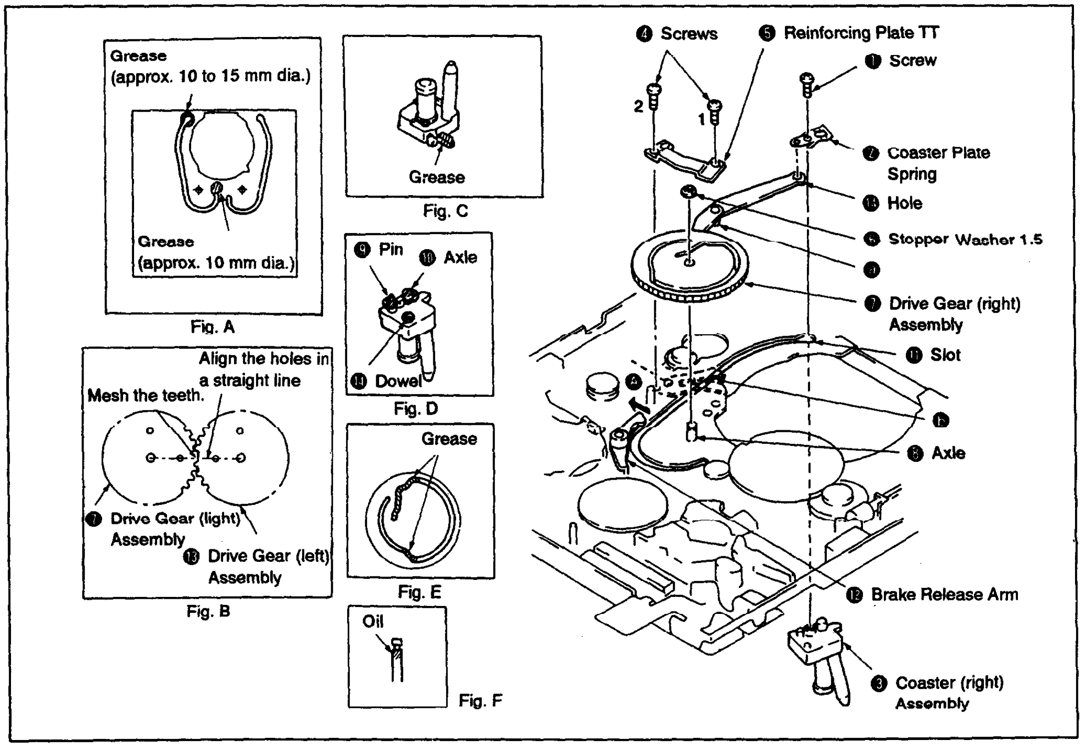

Grease
(approx. 10 to 15 mm dia.)
Grease
(approx. 10 mm dia.)
Fig. A
Align the holes in a straight line
Mesh the teeth.
❼ Drive Gear (light) Assembly
⓭ Drive Gear (left) Assembly
Fig. B
Grease
Fig. C
❾ Pin
❿ Axle
⓯ Dowel
Fig. D
Grease
Fig. E
Oil
Fig. F
❹ Screws
❺ Reinforcing Plate TT
❶ Screw
2
1
❷ Coaster Plate Spring
⓮ Hole
❻ Stopper Washer 1.5
ⓐ
❼ Drive Gear (right) Assembly
⓫ Slot
Ⓐ
ⓑ
❽ Axle
⓬ Brake Release Arm
❸ Coaster (right) Assembly

Fig. 3-19.

3-19. COASTER (LEFT) ASSEMBLY, DRIVE GEAR (LEFT) ASSEMBLY

1. Removal (See Fig. 3-20.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the drum assembly as described in section 3-13.
3) Remove the switch lever assembly and the pinch roller sub-arm assembly as described in section 3-14.
4) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
5) Remove the coaster (right) assembly and the drive gear (right)assembly as described in section 3-18.
6) Remove the screw ❶, then remove the coaster plate spring ❷ and the coaster (left) assembly ❸.
7) Remove the two screws ❹, then remove the reinforcing plate SS assembly ❺.
8) Remove the stopper washer 1.5 ❻, then remove the drive gear (left) assembly ❼.

2. Installation (See Fig. 3-20.)

1) Grease the points of the mechanism chassis shown in Fig A.
2) Apply half a drop of oil to the axle ❽ (See Fig. E).
3) Grease pin ❾, axle ❿ and dowel ⓰ of the coaster (left) assembly ❸ (See Fig. B).
4) Mount by aligning the pin ❾ and the axle ❿ with the slot ⓫ of the mechanism chassis.
5) Fit the drive gear (left) assembly ❼ to the axle ❽, and mount so that the gear engages with the wheel gear ⓭ and the UL gear ⓮.
6) Align the ⓐ part with the slot ⓫, and the hole ⓮ with the pin ❾ of the coaster (left) assembly ❸.
7) Install the stopper washer 1.5 ❻.
8) Mount by aligning the coaster plate spring ❷ with the axle ❿ and pin ❾ of the coaster (left) assembly ❸, then secure with the screw ❶.
9) Mount the reinforcing plate SS assembly ❺ aligning it with the dowel ⓯, then tighten the two screws ❹ in the indicated order.
10) Grease points indicated in Figs. C and D.
11) Mount the coaster (right) assembly and the drive gear (right)assembly as described in section 3-18.
12) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
13) Mount the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
14) Mount the drum assembly as described in section 3-13.
15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:
- Screw ❶ should be tightened with a tightening torque of approx. 500g•cm. If tightened too much, the coaster (right) assembly ❸ and the coaster plate spring ❷ will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.

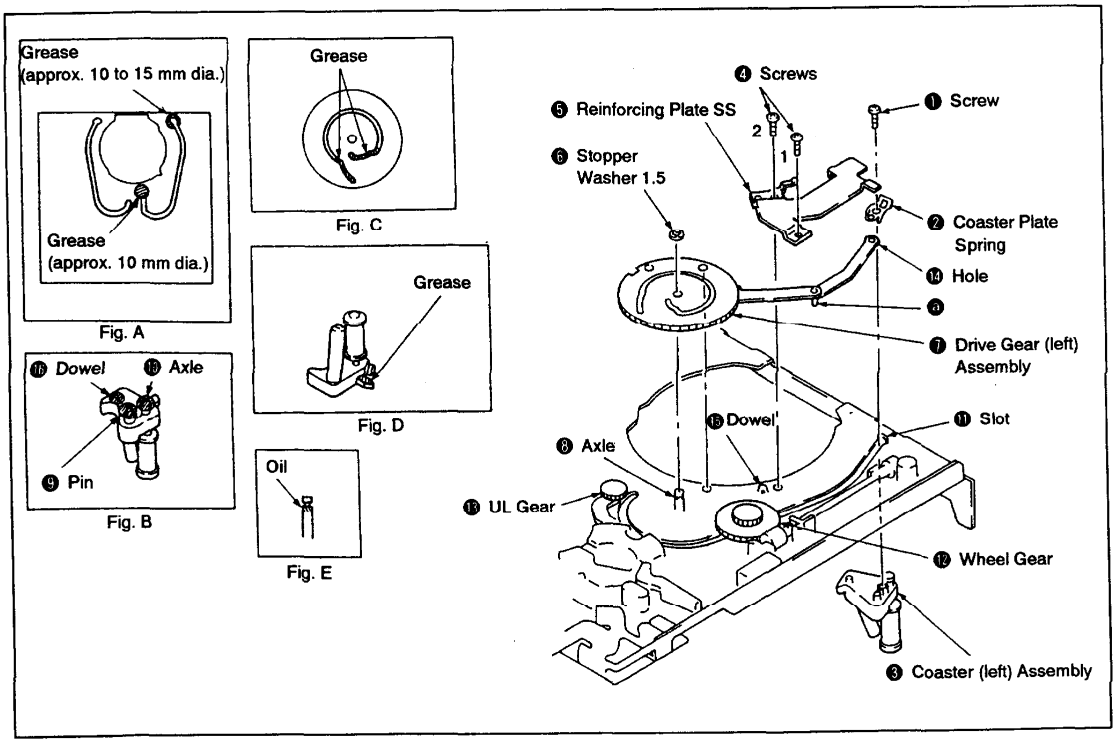

Grease
(approx. 10 to 15 mm dia.)
Grease
(approx. 10 mm dia.)
Fig. A
⓰ Dowel
⓾ Axle
❾ Pin
Fig. B
Grease
Fig. C
Grease
Fig. D
Oil
Fig. E
❹ Screws
❺ Reinforcing Plate SS
2
1
❻ Stopper Washer 1.5
❶ Screw
❷ Coaster Plate Spring
⓮ Hole
ⓐ
❼ Drive Gear (left) Assembly
⓯ Dowel
❽ Axle
⓫ Slot
⓭ UL Gear
⓬ Wheel Gear
❸ Coaster (left) Assembly

Fig. 3-20.

3-20. LOADING MOTOR, BRAKE RELEASE ARM, WHEEL GEAR, WORM ASSEMBLY

1. Removal (See Fig. 3-21.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
3) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
4) Remove the drive gear (right) assembly as described in section 3-18.
5) Remove the drive gear (left) assembly as described in section 3-19.
6) Remove the two screws ❶, then remove the loading motor assembly ❷.
7) Remove the brake release arm ❸.
8) Remove the stopper washer ❹, then remove the wheel gear ❺.
9) Remove the worm assembly ❻ from the six claws ❼.

2. Installation (See Fig. 3-21.)

1) Mount the worm assembly ❻, matching it to the six claws ❼.
2) Grease the shaded parts of the worm assembly ❻ (five places) (see Fig A).
3) Apply half a drop of oil to the axle ❽ (See Fig. B).
4) Fit the wheel gear ❺ to the axle ❽ and engage it with the gear of the worm assembly ❻.
5) Mount the brake release arm ❸.
6) Grease the whole perimeter of the gear of the loading motor assembly ❷.
7) Align the loading motor assembly ❷ with the mechanism chassis and secure it with the two screws ❷.
8) Mount the drive gear (left) assembly as described in section 3-19.
9) Mount the drive gear (right) assembly as described in section 3-18.
10) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
11) Mount the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
12) Mount the DC motor (capstan motor) as described in section 3-3.

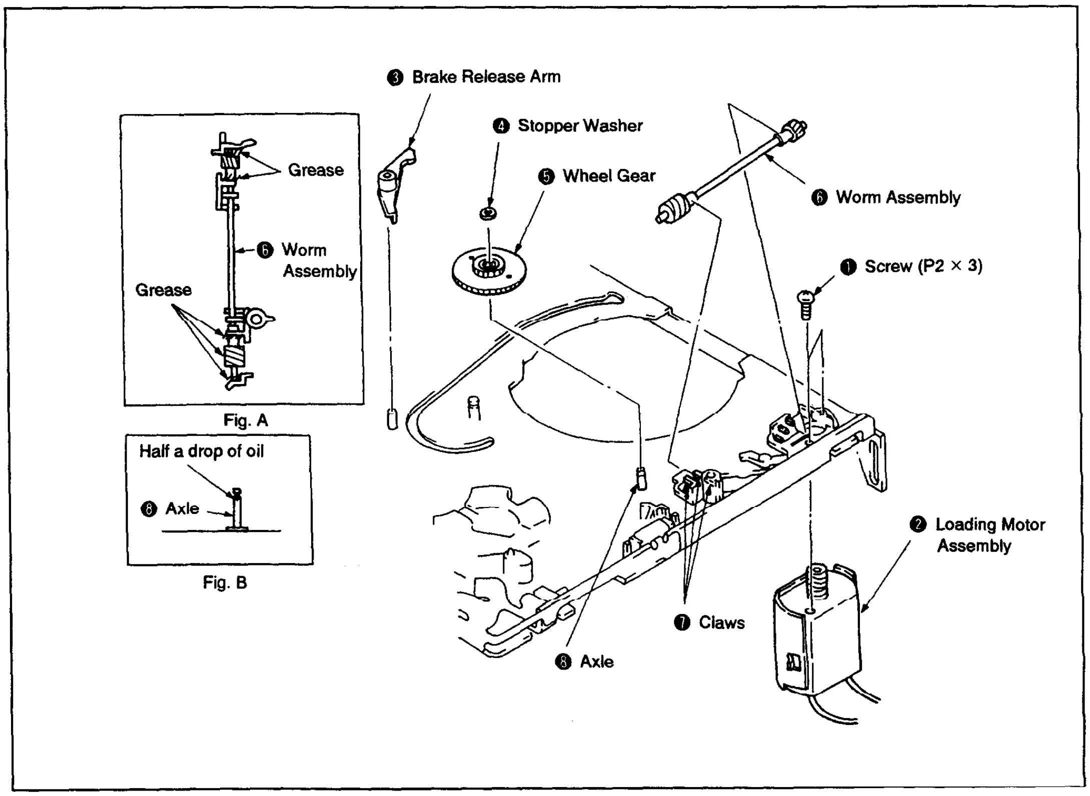


Fig. A

Fig. B

Fig. 3-21.

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removal

- If possible, make a recording before removal.

1) Detach the six solderings ⓐ, then use a pair of tweezers or the like to confirm that the terminals passing through the board holes from below can move freely.
2) Remove the two screws ❶ (See Fig. 3-22).
3) Mount the jig ❹ (Ref. No. J-7) with the two supplied screws ❷, then screw the attached hexagon socket screws ❸ to the jig ❹. The rotary upper drum ❺ will move upward and come off (See Fig. 3-23).

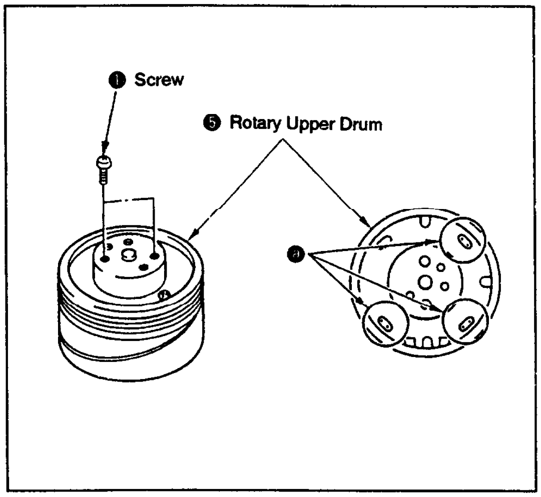


Fig. 3-22.

2. Installation

1) Wipe clean the flange surface and the rotary upper drum ❺ surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig ❼ (Ref. No. J-7) into the drum positioning hole, then set the rotary upper drum ❺ by passing the jig through its positioning hole ❻.

   Note: Confirm that the terminals ❽ protrude slightly from the rotary upper drum board holes (See Fig. 3-24).
3) Remove the jig ❼ and push down the rotary upper drum ❺ gently by hand. If it does not go all the way down, secure it temporarily by tightening the two hexagon socket screws ❶ alternately.
4) Insert the jig ❼ into the positioning hole ❻ again and confirm that it goes in smoothly. If it does not, loosen the two screws ❶, repeat step 3 of the Removal paragraph and restart the setting procedure.
5) Tighten the screws ❶.
6) Solder the terminals ❽ (ⓐ in Fig. 3-22).

   Note: Take care that no solder flows below the board.

Note: After installing, be sure to perform tape path adjustment as described in section 4.

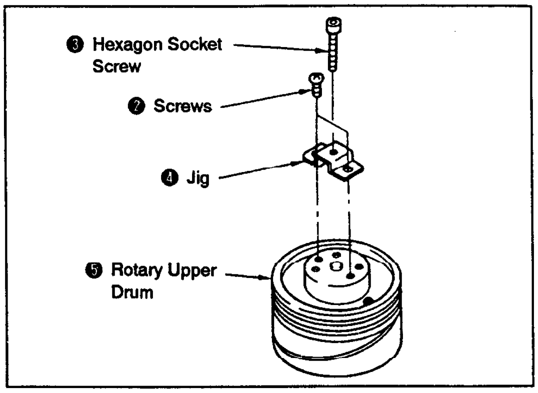


Fig. 3-23.

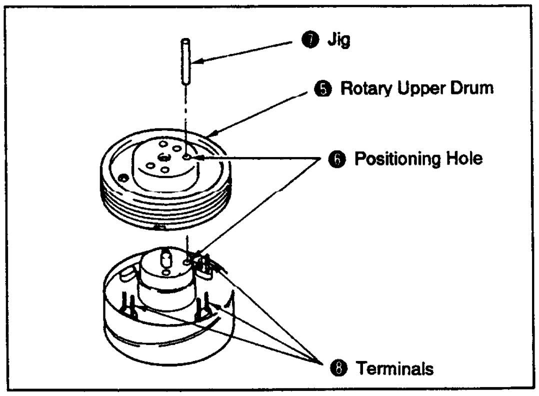


Fig. 3-24.

3-22. FWD BACK TENSION (See Fig. 3-25.)

1) Set the torque cassette (Ref. No. J-6).
2) Set the FWD mode and confirm that S reel table torque value is within 9 to 13 g•cm.
3) If the torque value does not meet the specification, adjust the adjust arm ❶.

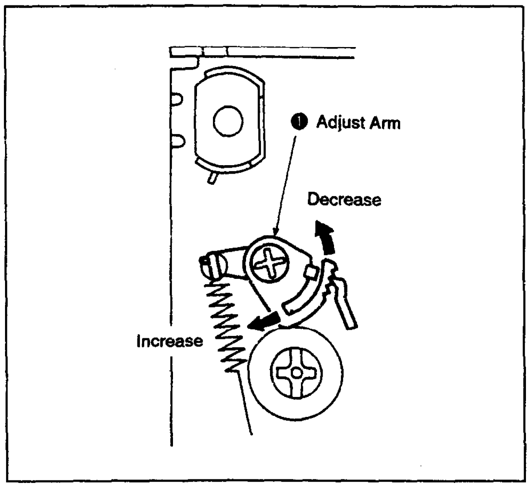


Fig. 3-25.

3-23. REEL TORQUE CHECK

1) Set the torque cassette.
2) Set the FWD mode and confirm that T reel table torque value is within 7 to 15 g•cm.
3) Set the REV mode and confirm that S reel table torque value is within 29 ± 6 g•cm.
4) Set the REV mode and confirm that T reel table torque value is within 13 to 25 g•cm.
5) If a torque value does not meet the specifications above, replace the corresponding reel table.

4. TAPE PATH ADJUSTMENT

[The Track Shift Mode]

In the 8 mm video system, instantaneous tape speed control is performed using four kinds of pilot signals, and high-precision tracking is achieved through the ATF (Automatic Track Finding) system. This makes a tracking control knob unnecessary and allows for precise tracing.

On the other hand, however, tape path adjustment presents some difficulties when the ATF system is used. Namely, since the ATF system will automatically compensate to some degree for head tracing errors, thorough adjustment is not possible.

This can be solved by setting the track shift mode for tracking fine adjustment. ATF will be compulsorily activated, shifting the tracking amount by a fixed amount (approx. 1/4) and thus making tracking fine adjustment easy. Furthermore, no track shift jigs are required.

4-1. TRACK SHIFT MODE SETTING

[Setting Procedure]

- Connect the TEST A and TEST B terminals to the COM terminal.

  Example:

  NTSC ········ GV-8

  PAL ·········· GV-8E

  Connect Pins ① and pin ③ of CN017 on the $\left\{\begin{array}{l}\text{SV-34 board (GV-8)}\\ \text{SV-35 board (GV-8E)}\end{array}\right\}$ to pin ② of it. (See Fig. 4-1)

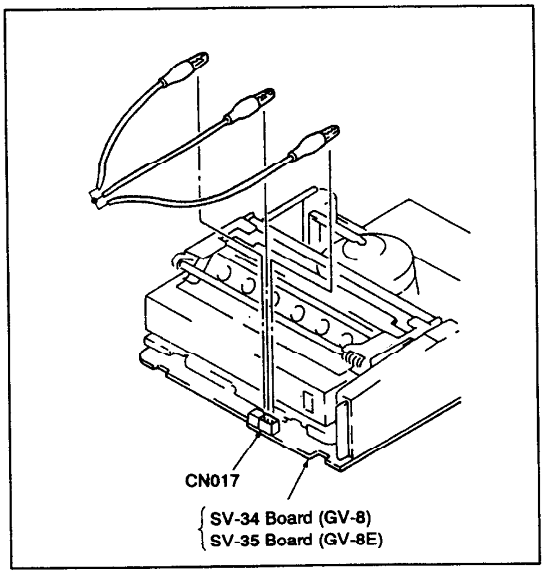
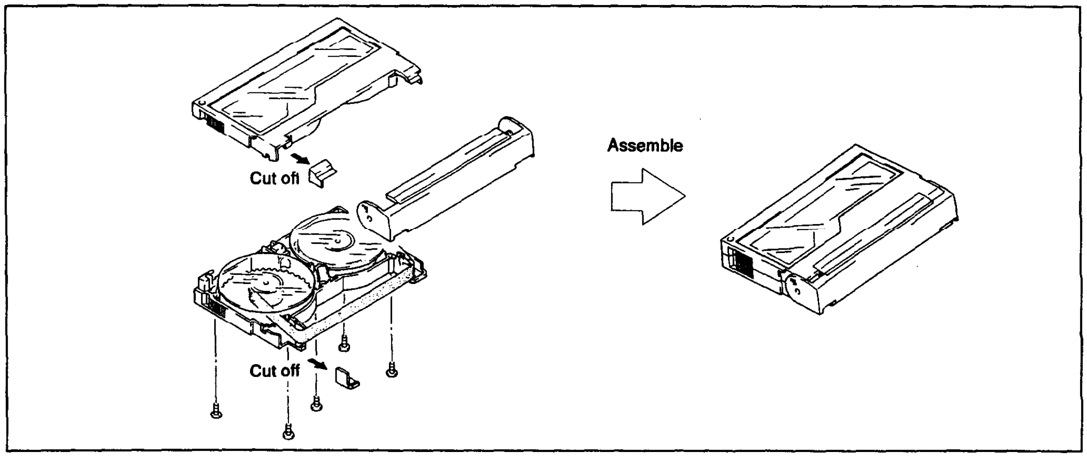


Fig. 4-1.

[Note on Adjustment of No.7 Guide (TG-7)]

The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig. 4-2).
Therefore, when performing section 4-6. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-5), modified as follows, and perform adjustment in playback mode.


Cut off
Cut off
Assemble

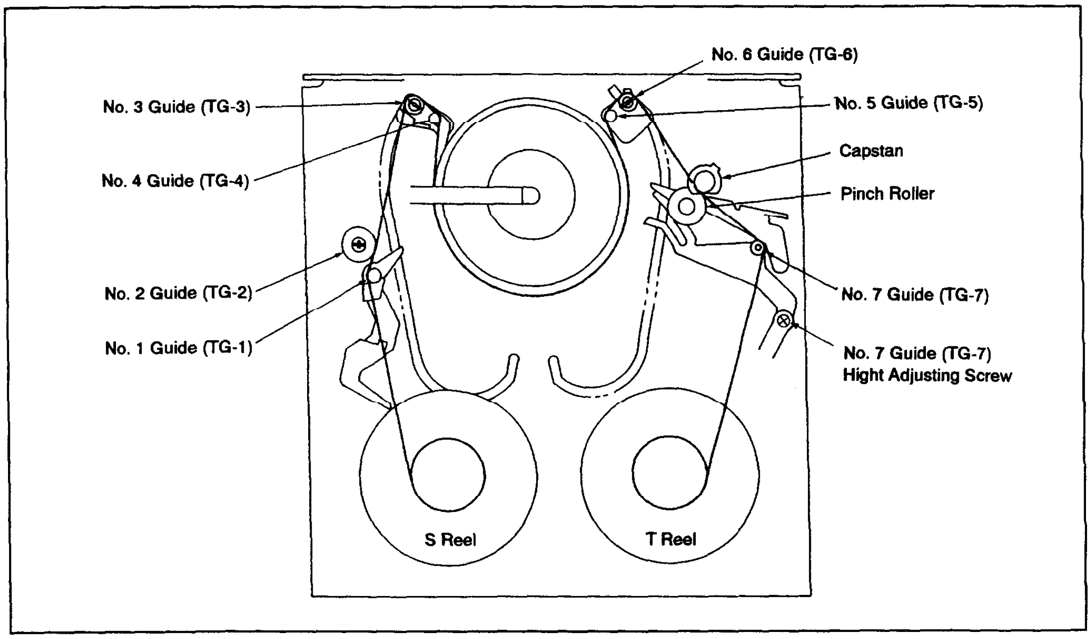

No. 6 Guide (TG-6)
No. 3 Guide (TG-3)
No. 5 Guide (TG-5)
Capstan
No. 4 Guide (TG-4)
Pinch Roller
No. 2 Guide (TG-2)
No. 7 Guide (TG-7)
No. 1 Guide (TG-1)
No. 7 Guide (TG-7)
Hight Adjusting Screw
S Reel
T Reel

Fig. 4-2.

4-2. PREPARATIONS FOR ADJUSTMENT

1) Clean tape path surfaces (tape guides, drum, capstan shaft, pinch roller) (See Fig. 4-2).
2) Connection of oscilloscope and output method of waveform.
   CH 1: RF signal output of the drum head (V RF OUT)
   Method for signal output:
   Short-circuit the external trigger output (RF SW. P) and GND.

   Example:
   NTSC ····· GV-8
   PAL ······· GV-8E
   CH 1: Pin ③ (V RF OUT) of CN018 on the
   SV-34 board (GV-8)
   SV-35 board (GV-8E)
   Method for signal output:
   Short-circuit pin ① (GND) and pin ② (RF SW.P) of CN018 on the
   SV-34 board (GV-8)
   SV-35 board (GV-8E)
3) Play back the alignment tape for tracking adjustment (Ref. No. J-5).
4) Confirm that both the entrance and exit side RF waveforms of the oscilloscope are flat (See Fig. 4-4). If they are not, adjust as follows.

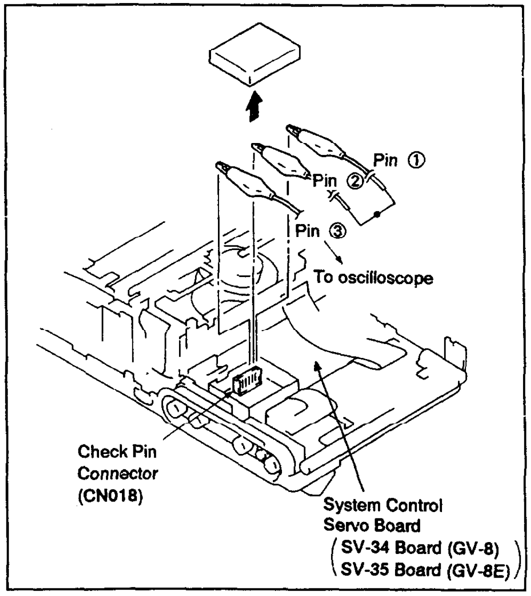

Pin ①
Pin ②
Pin ③
To oscilloscope
Check Pin Connector (CN018)
System Control Servo Board
SV-34 Board (GV-8)
SV-35 Board (GV-8E)

Fig. 4-3.

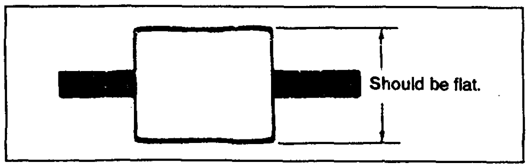

Should be flat.

Fig. 4-4.

4-3. TRACKING ADJUSTMENT (See Fig. 4-5.)

1) Play back the alignment tape for tracking adjustment.
2) Pass a hexagonal wrench, screwdriver (Ref. No. J-11) or the like through the hole ❶, loosen the lockscrew ❷ a little, then make the entrance side waveform flat by turning the No. 3 guide (TG-3) ❸.
3) Pass a hexagonal wrench, screwdriver or the like through the hole ❹, loosen the lockscrew ❺ a little, then make the exit side waveform flat by turning the No. 6 guide (TG-6) ❻.

Note: Take care not to loosen lockscrews too much, since guides come loose easily.

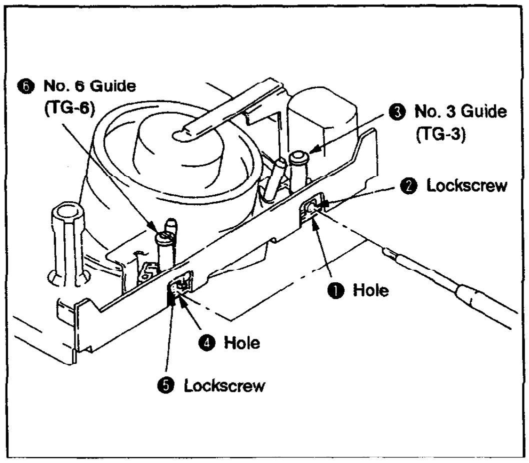

❻ No. 6 Guide (TG-6)
❸ No. 3 Guide (TG-3)
❷ Lockscrew
❶ Hole
❹ Hole
❺ Lockscrew

Fig. 4-5.

4-4. TRACKING FINE ADJUSTMENT (See Figs. 4-5. and 4-6.)

1) Play back the alignment tape for tracking adjustment and set the track shift mode.
2) Confirm whether the waveform is flat. If it is not, turn the No. 3 (TG-3) and No. 6 (TG-6) guides so that it becomes flat.
3) Fix the No. 3 guide ❸ by tightening its lockscrew ❷. Then confirm that the entrance side waveform has not changed.
4) Fix the No. 6 guide ❻ by tightening its lockscrew ❺. Then confirm that the exit side waveform has not changed.

Note: The set screws ❷ and ❺ should be tightened with a tightening torgue of approx. 200g•cm ± 10%.
If tightened too much, there is danger of damaging the thread.

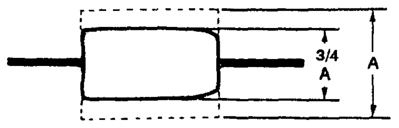


Fig. 4-6.

4-5. No. 2 GUIDE (TG-2) ADJUSTMENT

When the No. 2 guide has been turned or replaced, perform height presetting before this adjustment.

4-5-1. No. 2 Guide (TG-2) Height Presetting (See Fig. 4-7.)

1) Adjust the height from the mechanism chassis upper surface to the TG-2 upper flange ❶ upper surface to 18.6 mm by rotating the TG-2 upper flange ❶.

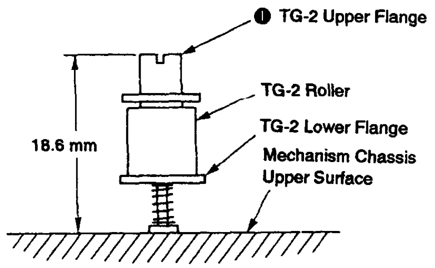


Fig. 4-7.

[Reference]
This U mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7). To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Counterclockwise
	Lower	Clockwise

4-5-2. No. 2 Guide (TG-2) Adjustment (See Figs. 4-8. and 4-9.)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange ❷ of the No. 2 guide (TG-2) ❶ (See Fig. 4-8). If it is, turn the upper flange ❸ of the No. 2 guide (TG-2) ❶ clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and tracking fine adjustment as described in sections 4-3. and 4-4.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (See Fig. 4-9), turn the upper flange ❸ of the No. 2 guide (TG-2) ❶ 90° counter-clockwise and repeat step 5.
Repeat steps 5 and 6 until a normal waveform is obtained. Then, confirm that the tracking waveform has not changed. If it has, perform fine adjustment of entrance side tracking and repeat step 5.

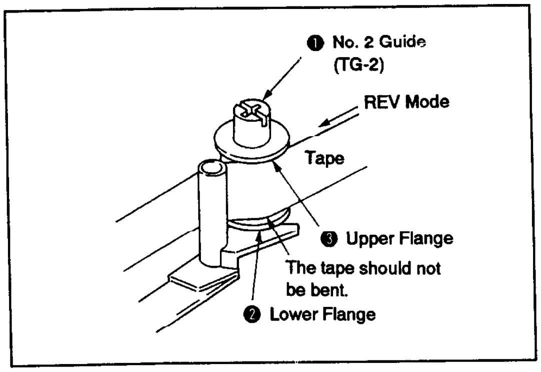

❶ No. 2 Guide
(TG-2)
REV Mode
Tape
❸ Upper Flange
The tape should not be bent.
❷ Lower Flange

Fig. 4-8.

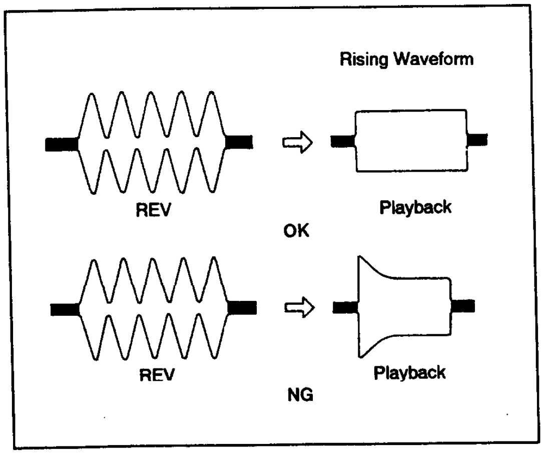

Rising Waveform
REV
OK
Playback
REV
NG
Playback

Fig. 4-9.

4-6. No. 7 GUIDE (TG-7) ADJUSTMENT (See Fig. 4-10.)

1) Play back the alignment tape for tracking adjustment and set the REV mode.
2) Confirm that the tape is not bent between the No. 6 guide (TG-6) ❶ and the capstan ❷ . If it is, turn the hight adjusting screw ❹ of the No. 7 guide (TG-7) ❸ until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan ❷ and the hight adjusting screw ❹ of the No. 7 guide (specification:0.5 mm or less) . If the tape is bent beyond the specification, turn the No. 7 guide (TG-7) ❸ until bending is within the specification (0.5 mm).
If in the REV mode tape bending between the No. 6 guide (TG-6) ❶ and the capstan ❷ is 0.3 mm or less, adjustment can be considered completed.

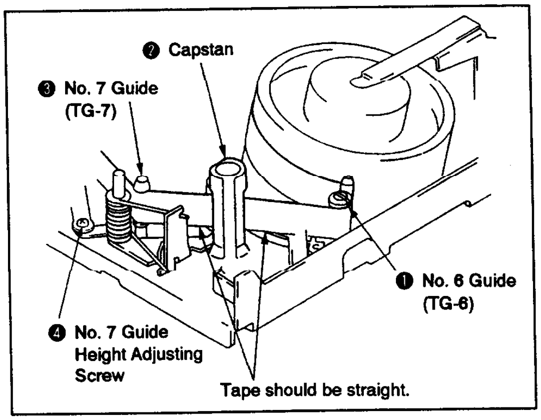

❷ Capstan
❸ No. 7 Guide
(TG-7)
❶ No. 6 Guide
(TG-6)
❹ No. 7 Guide
Height Adjusting
Screw
Tape should be straight.

Fig. 4-10.

4-7. CUE AND REV WAVEFORM CHECK (See Fig. 4-11.)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (See Fig. 4-11). In case pitch is not constant, perform section 4-4. Tracking Fine Adjustment and section 4-6. No. 7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (See Fig. 4-11). Otherwise, perform section 4-4. Tracking Fine Adjustment.

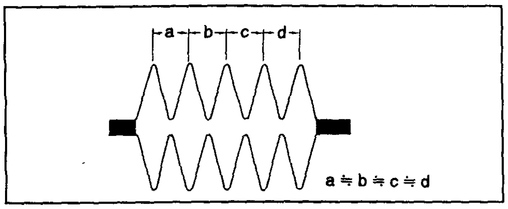


Fig. 4-11.

4-8. CHECK AFTER ADJUSTMENT

4-8-1. Tracking Check

1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (See Fig. 4-12).
2) Then, confirm that the minimum amplitude value (EMIN) is 65% of the maximum value (EMAX) or larger (See Fig. 4-13).
3) Confirm that no large fluctuations occur on the waveform (See Fig. 4-14).

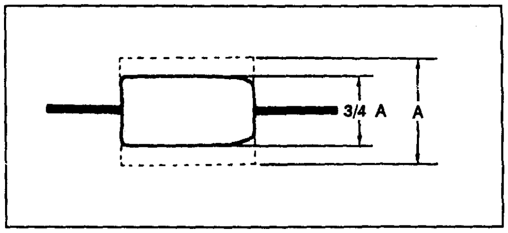
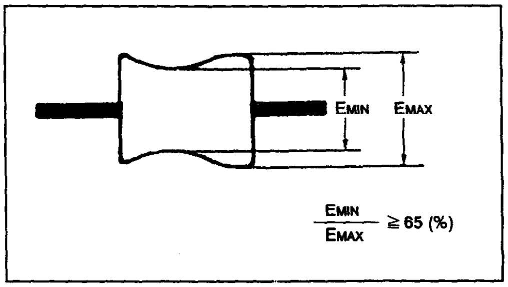
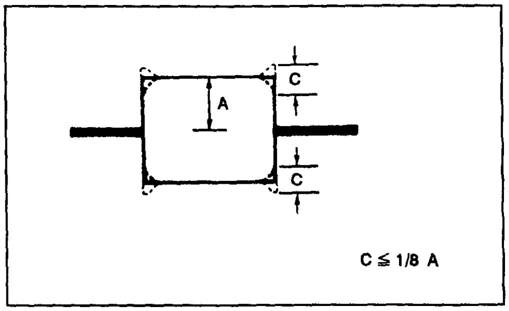


Fig. 4-12.



$$\frac{E_{MIN}}{E_{MAX}} \geqq 65\ (\%)$$

Fig. 4-13.

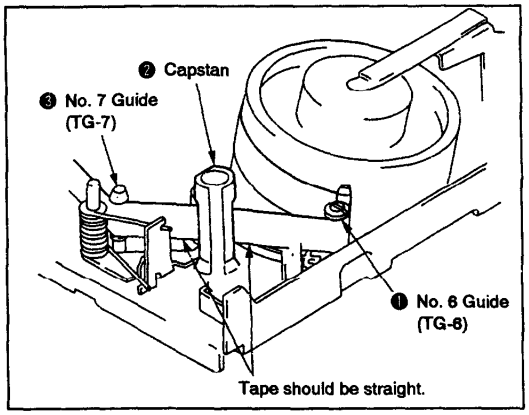


$C \leqq 1/8\ A$

Fig. 4-14.

4-8-2. Rising Check (See Fig. 4-15.)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller (See Fig. 4-15).
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.


❷ Capstan
❸ No. 7 Guide (TG-7)
❶ No. 6 Guide (TG-6)

Tape should be straight.

Fig. 4-15.

4-8-3. Tape Path Check (See Fig. 4-16.)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3 mm, at the lower flange of the No. 2 guide, the upper flange of the No. 3 guide, the upper flange of the No. 6 guide and the No. 7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3 mm at the flanges of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

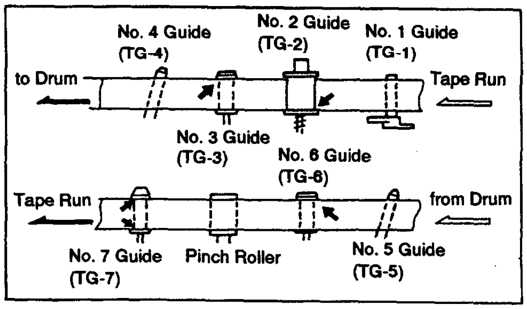

No. 4 Guide (TG-4)
No. 2 Guide (TG-2)
No. 1 Guide (TG-1)
to Drum
Tape Run
No. 3 Guide (TG-3)
No. 6 Guide (TG-6)
Tape Run
from Drum
No. 7 Guide (TG-7)
Pinch Roller
No. 5 Guide (TG-5)

Fig. 4-16.